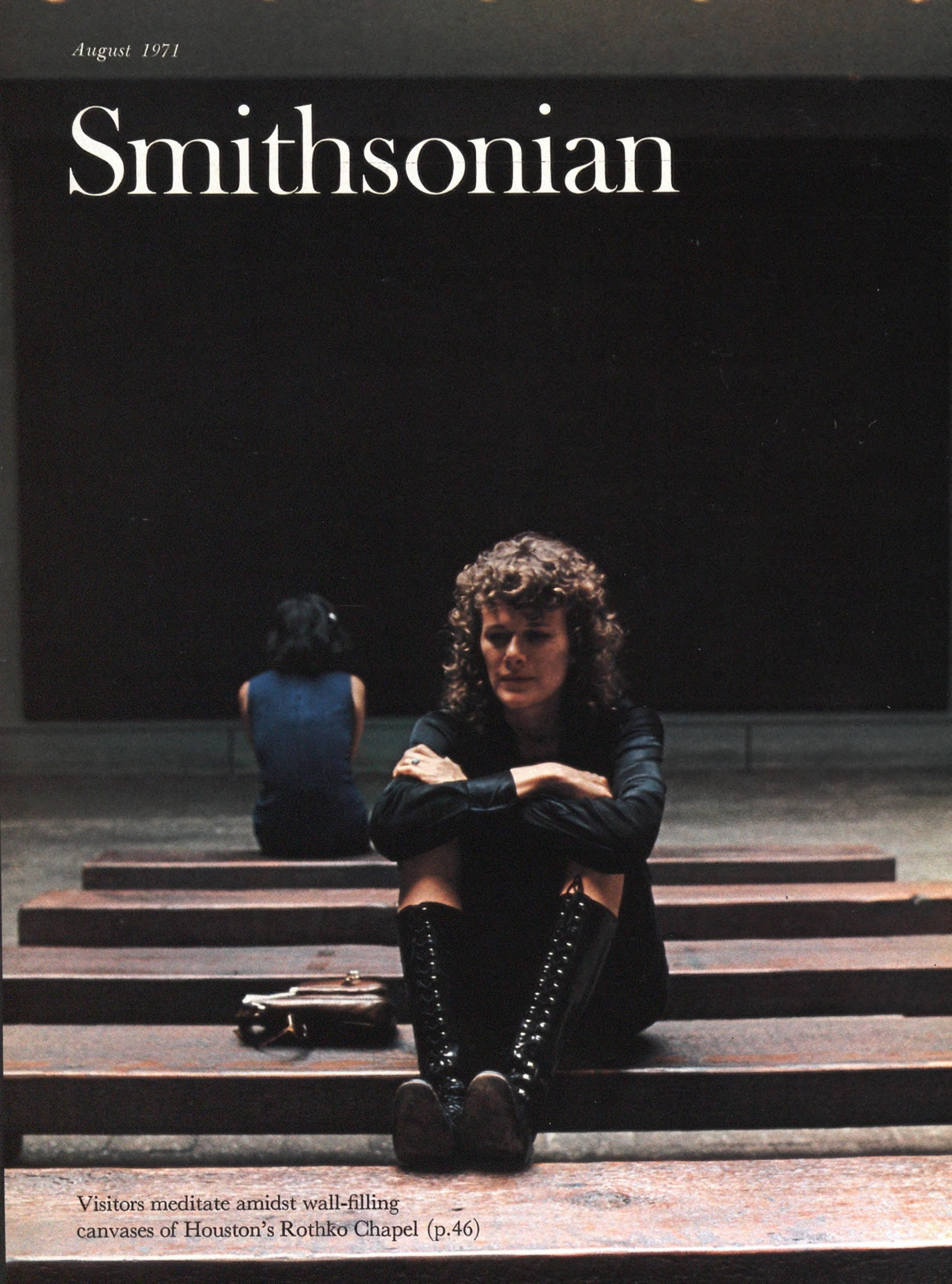
August 1971

Smithsonian



Visitors meditate amidst wall-filling
canvases of Houston's Rothko Chapel (p.46)

August 1971

Smithsonian

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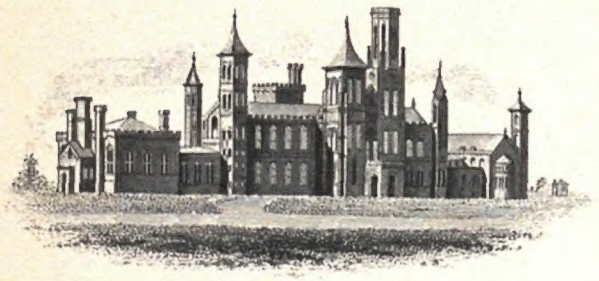
Secretary Ripley's comments

The view from the castle



Museum research, too often limited,
could play an important and exciting role
in the drama of basic knowledge

Readers of these short essays must be aware of my feeling that education need not be a bore, that museums add to it the element of fun, and, therefore, that museums deserve our strong support (SMITHSONIAN, June 1971). A recent National Academy of Sciences research report states: "The natural history museums of the United States constitute an invaluable and long-neglected resource for public education and research. Seemingly remote from some of the more attention-getting areas on the frontiers of science, they have been allowed to become dusty, lonely and inadequately curated, with their collections lagging and their buildings sagging."

Museums of natural history, or museums of the life sciences as they might be called, are trapped by tradition. Classically, they have had two roles: to serve as repositories for collections in the various fields of natural history, and to exhibit such collections. In developing their collections, museums, like miniature colleges, have gathered specialist-scholars as well as curators. The collections form a vast data pool; the exhibits, as teaching aids to the general public or adjuncts to the schools, present information. But current museum staffs and activities associated with the collections can cover only a fraction of the sweep of the life sciences as disciplines in basic research.

In the life sciences report of the National Academy, museums were given only a few pages compared to the great deal of space allotted to "frontiers of biology" and other biological information. When 90 percent of the frontiers and breakthroughs of biology are in areas not explored by the research of museum curators, there is a growing imbalance that is becoming unbearable in terms of modern education and its needs.

What museums of this kind obviously must do is take a new look at exhibits and their function. Museums of natural history are still largely tied to those branches of the life sciences whose collections they house. Their exhibits are still designed by the curators of those collections. The museums would serve the present needs of education better if they revamped their exhibits as demonstration theaters like the anatomical theaters of the medical schools.

In the great science or natural science museums of the western world, measurable proportions of the adult and youthful populations could then supplement their education with open, undidactic exhibits using multimedia techniques now taken for granted. Breakthroughs in science, newly emerging principles of our universe, should be taught flexibly in museums with changing exhibits.

Public understanding of science and its principles is far too important to be overlooked. Indeed, the understanding of our surroundings is a matter of the utmost urgency. Such understanding will not be achieved solely in the universities. Nor can we trust ourselves to offer such understanding through industrially sponsored advertising or by following other typical routes of the media.

In times like these—times of questioning and doubt and urgency—the open text is by far the most believable road to understanding. Museums can provide it, but are inadvertently neglecting such a role.

S. Dillon Ripley

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Letters to the Editor

The view from the castle

Dear Sir: As a new Smithsonian member, I am enjoying immensely your articles that keep one aware of the biological world outside one's own scientific niche. However, as an inhabitant of a scientific niche, I take exception to Secretary Ripley's comments in the June issue on "fun in learning." The intent and actual sense of his comments are excellent. But the word "fun" in that context should fly out the window. Nothing under the sun can make Greek and Latin verbs "fun," or bones or muscles or organic chemistry formulas. They take discipline.
Elaine M. Thomas, M.D.
Brookfield, Wisconsin
See page two. Ed.

Dear Sir: I am somewhat concerned at some of Secretary Ripley's comments.

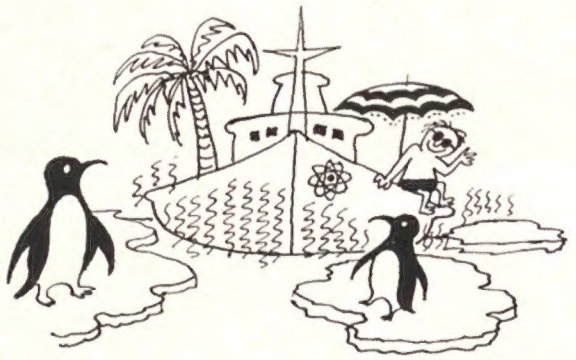
Should education be considered "machinery for transferring information"? Is a university successful because it provides "highly adequate training in a multiplicity of skills" to docile students? Such a limited concept of education will do little to prepare students to live in a rapidly changing society.

Mr. Ripley says, ". . . Authority is always a part of the transmission process in teaching. . . ." As one who sometimes resorts to authority in the classroom, I suggest that learning takes place, for the most part, in spite of authority—not because of it. Just as there are many students who "tend to confuse authority with power," there are many teachers who confuse authority with guidance.
Marie Massé
Topsfield, Massachusetts

Thermal pollution

Dear Sir: Jane Stein's article on thermal pollution prompts me to suggest one use of such pollution that would be a boon to shipping in icebound areas. A nuclear icebreaker with a heated hull would be able to melt its way through ice like a hot knife through butter. The heat would come from water pumped through the reactor core and out through tubes embedded in the skin of the ship. Two reactors might be used—one solely for heat and the other for propulsion and heat. The hull of the ship would simply be a large radiator, and the vessel would always be floating in a pool of warm water, regardless of how much ice surrounds it.

Think of it! A ship that could melt its way across the top of the world or through heavy ice in the Great Lakes on



its way to rescue some ice-locked commercial vessel. Meanwhile, the crew would be working in shirt-sleeves on deck.
George Baglietto
San Francisco, California

Dear Sir: In regard to Jane Stein's excellent article, "A hot debate, generated by hot water," many people are becoming aware of water thermal-pollution problems, but few have thought through the alternatives being presented to us. I concur with the article in that the dissipation of this energy into the atmosphere should not occur except as a most temporary solution.

As an executive engineer, I feel that the "waste" energy from power plants must be put to work. This will reduce pollution and also conserve the precious supply of natural fuel resources. The technology to recover the "waste" heat exists today and is utilized in at least 600 installations in the United States. The only prerequisite required today is that the generators of mechanical or electrical energy be brought to the site of the thermal load. This concept, called "total energy," is capable of utilizing 80 percent of the energy content of the fuel supply.
Philip L. Forde
Seattle, Washington

Dear Sir: Recently, Dr. Aden Meinel, professor of Astronomy and Optical Sciences at the University of Arizona, announced his idea for a pollution-free solar power facility to be constructed in an area covering a vast tract in the southwestern U.S. desert. Dr. Meinel estimates that, with the use of new technology, his proposed solar-energy collectors would produce four times as much electrical power as the United States now uses.
David Wasserman
Tucson, Arizona
Dr. Meinel's proposal is for a National Solar Power Facility (a joint project for the United States and Mexico) that would have a total generating capability of a million megawatts, utilizing thermal conversion of solar energy. Projecting future power needs a century from now, he proposes that the facility be located in a 115-by-115 mile uninhabited arid zone in the Southwest. The waste heat from a thousand 1,000-megawatt power generating stations would be sufficient to provide 50 billion gallons of desalinated seawater per day, enough for 120 million people, and could supply the electric power needs of the United States and northern Mexico by the year 2076. Ed.

Conservation

Dear Sir: In view of your articles on pollution problems, I thought you might be interested to know that, when I give talks to Boy Scouts and Girl Scouts, I am often asked if conservation is new. My answer is no. For example, while George Washington was President he wrote to his farm manager complaining about the replacement of floral fence rows.
William E. Asbury
Columbus, Ohio

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Bearded and oxlike, the wildebeest is the largest
(400 pounds) and most numerous of Africa's antelope.

A small party of zebras bunches nervously, ready to join the massing herds of wildebeest.

Photographs by Dmitri Kessel

The river across the Serengeti: a yearly flood tide of wildebeest

With the end of the rains, the wildebeest and a few friendly zebras join forces to put on Africa's most spectacular show

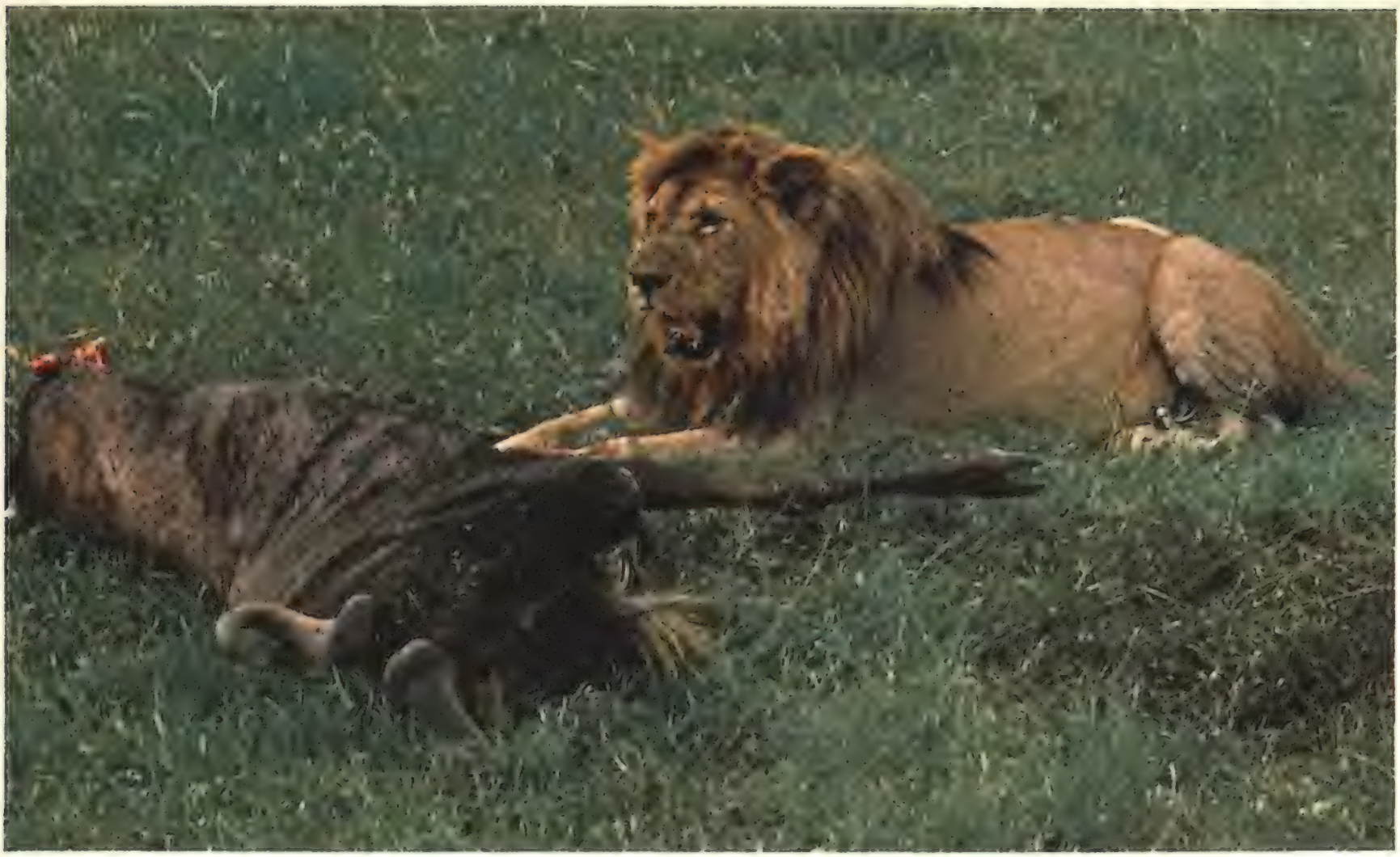
The Bushman word is *nqu*. From that we derive *gnu*, an especially useful word in crossword puzzles. But on the plains of East Africa, the word is wildebeest.

Wildebeest are antelope, oxlike cud-chewing antelope with thick necks and low hindquarters. Though related to the graceful gazelles, they look as though they were made of spare parts from horses and water buffalo. The males, when patrolling their harems of 20 or 30 females during the rutting season, often threaten each other with stiff-legged leaps which seem to human observers more comical than dangerous; they are known as the clowns of the plains.

Bearded, noisy and gregarious, wildebeest are the main component of one of East Africa's most spectacular events: the annual 800-mile mass migration from the grassy Serengeti Plains of Tanzania to western and then northern feeding grounds and finally, over a half year later, south again to the Serengeti. How this migration organizes itself to leave the Serengeti is shown in the accompanying photographs.*

It is usually May when the rainy season ends in the Serengeti grasslands, and the wildebeest and a few zebras gather for the trek westward for winter grazing, though the time can vary by four or five weeks. Some 350,000 to 400,000 wildebeest have been scattered

* Life Magazine © Time Inc.



Fate of a straggler: As wildebeest go through a lion's territory, he occasionally exacts his toll.

throughout the plains grazing for three or four months. Calves were born in January and February. By May the rutting season is just about over. It is growing hot and dry.

The wildebeest have been sharing the rich grasslands with well over a million other grazing animals—27 other species of antelope, as well as zebras, giraffes and other herbivores. Different species eat the grass at different stages of its growth and usually in a regular sequence: Zebras first, then wildebeest, then hartebeest, then elands, and so on. Grazing is complementary, not competitive. Zebras, for example, with long incisors, eat coarser kinds of grass than antelope.

All these herbivores have evolved in concert with the cycles of the grass and, as it replenishes itself in the annual rains, the hoofed animals feed. And they in turn form the major source of food for the carnivores—the lions, cheetahs, hyenas, leopards—which have evolved along with the herbivores in the biologically harmonious "pyramid" of food relationships that rests upon the Serengeti's grasses.

By May the plains are fairly well eaten down; the grass has begun to fail along with the rains. Unlike pastures that are grazed by trampling herds of cattle (which select only sweet grasses, thus permitting the less nutritionally valuable species to take over), the Serengeti grasslands will come back lush and green and diverse with the next year's rainy season. But now it is time for the animals to leave.

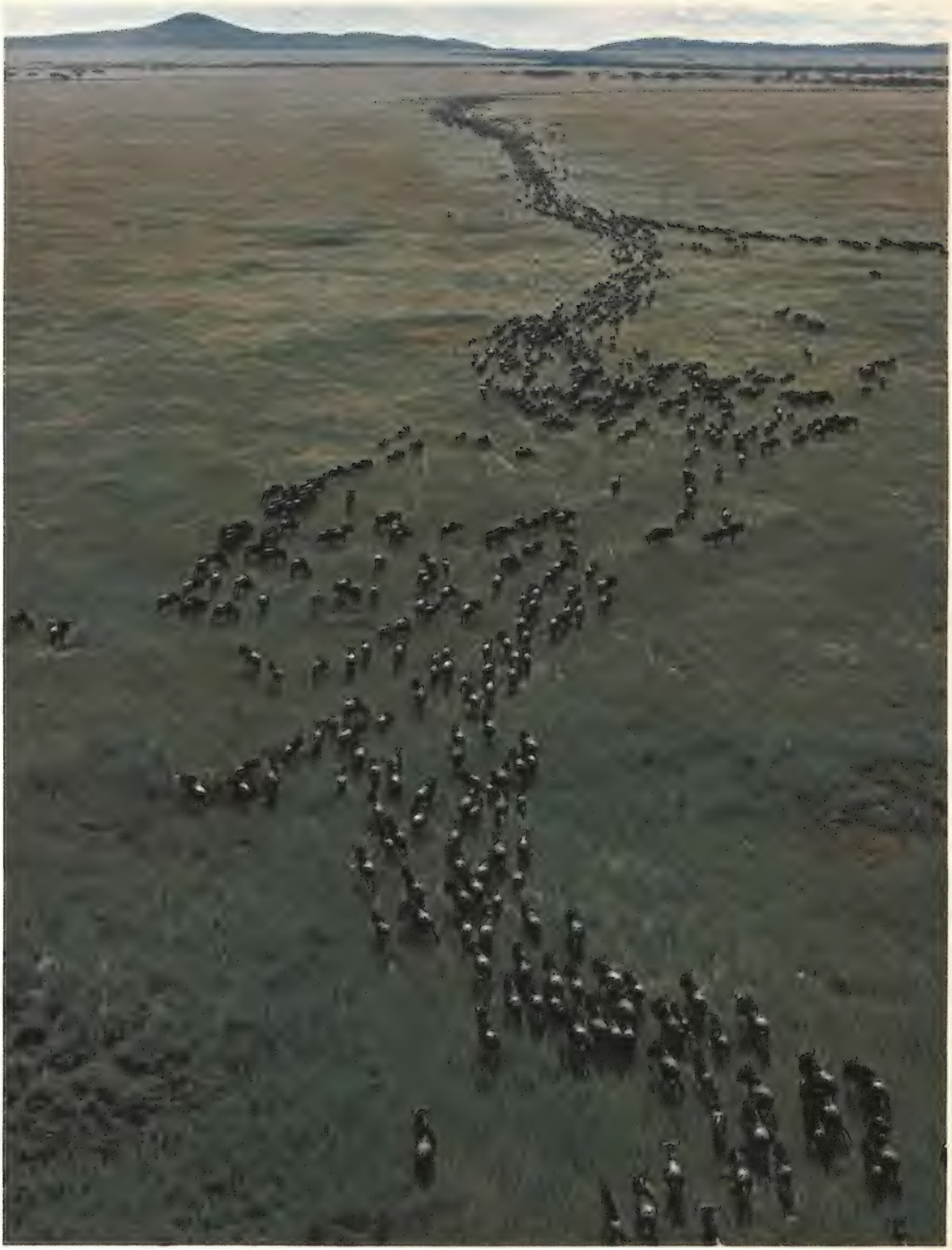
The wildebeest begin to stream together to form large herds, usually of about 50,000 animals, massing and milling, snorting and lowing. One year the build-up took three days: The animals covered an area four miles by eight.

Most of the carnivores have relatively fixed territories in the plains, and though it would seem like shooting fish in a barrel, they do not follow the mass migration. But as the wildebeest pass through these territories to gather into larger herds, lions and other predators will pick off stragglers or strays.

The growing wildebeest herds are joined by small, congenial parties of Burchell's zebras, bright phalanxes among the dark, antlike mass. Then some combination of signals, not yet wholly understood but certainly including the weather as the primary element, triggers the mass migration.

A stream of wildebeest moves out from the milling thousands. Others follow into the stream and yet other small herds join the mass and, with zebras here and there like whitecaps, a wide dark river flows westward,

Continued on page 14



In merging streams, animals cross the plains.
They will join yet others in herds of up to 50,000.

Massed and ready, wildebeest and a sprinkling of zebras graze and wait for the mass migration to begin.

bleating, mooing, grunting, toward the far horizon.

For days they maintain their pace of march—a walk—through the hot, dry savanna, pausing to graze briefly in places where the grass is good. They break into a canter only when the game division plane or helicopter flies too low overhead.

By June, the noisy river of wildebeest and their accompaniment of zebras reaches the higher brush country in the west. Pausing only for a few weeks, they will move again, north of the Serengeti where there is permanent water, shade and still more grass. The main body of the Serengeti's zebras—some 280,000—along with the gazelles and elands, have taken a different route to these same feeding grounds.

Why don't these animals stay in the north all year? Some suggest the flies are bad. Perhaps it is the urge to calve on ancestral grounds. In any event, by November the rains usually begin back in the Serengeti; the wildebeest mass for the return trip south.

In this phase of the migration, the gazelles and zebras (which may be more sensitive to weather changes that signal distant rains) lead the way south with the wildebeest following in long regular columns. Arriving on the Serengeti's greening plains, the wildebeest calve and graze and mate—remaining until May or thereabouts when once more it is time to move.

No safety in numbers

Unaggressive toward men and vastly numerous, wildebeest would hardly appear to be an endangered species. But no wild animal can be counted completely safe these days, and some observers scent rising pressures on the wildebeest's spectacular existence.

Masai herdsmen, in various parts of their ancestral lands, are being encouraged by African governments to give up nomadism and to fence their cattle in exclusive grazing areas. This practice may well spread to Masai lands in and around the Serengeti, with predictably unhappy effects on the grasslands. And it would end the migrations as such.

To the south, for example, in Kenya's 44-square-mile Nairobi National Park, wildebeest herds still display their ancient migratory urge but, hemmed in by the natural and man-made boundaries of the park, they can at best move north and south a few miles. Scientists refer to these movements as "seasonal distribution"—a paltry term and a minor event when compared to the magnificent flowing and eddying rivers of wildebeest that cross the Serengeti each year.

Migration at flood tide: nothing but wildebeest and zebras flowing westward as far as the eye can see.

Photographs by Roger J. Cheng

The mini-events of the weather

Thunderbolts, hailstorms, even air pollution are forged from minuscule developments only recently recorded by photomicrographs

Weathermen are fond of the notion that when someone on the other side of the world sneezes, we will sooner or later feel its meteorological effects overhead. True enough, but the problem lies in perceiving the tiny events that make up so large a phenomenon as weather. That is exactly the problem Roger Cheng is working on.

A research associate with the Atmospheric Science Research Center of the State University of New York at Albany, Cheng has developed techniques for making photomicrographs that show weather's "origins."

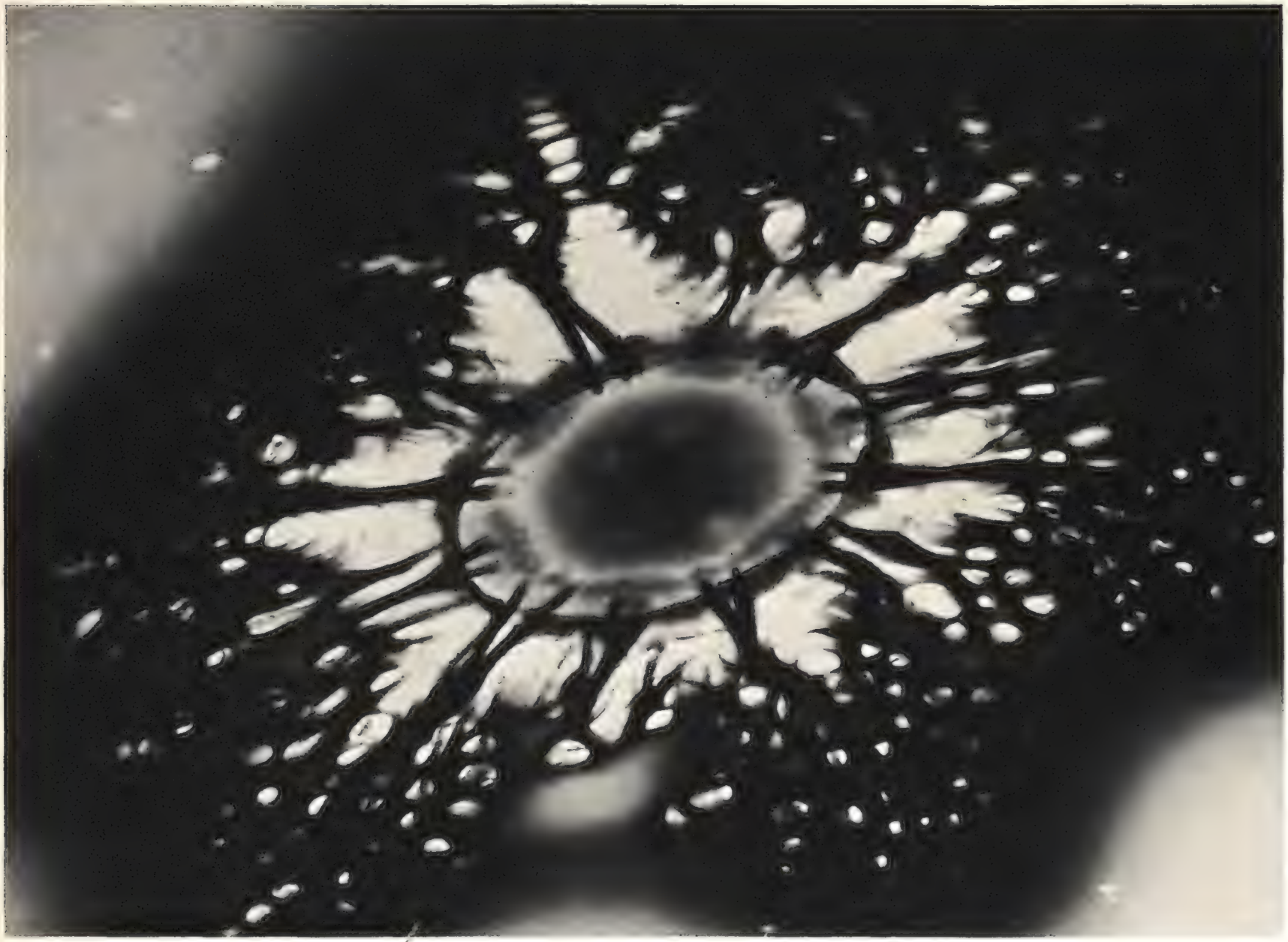
At left is a laboratory-produced ice particle like the hailstones that form in a cloud. As a hailstone falls, it encounters warmer, moist air, and a dustlike layer of frost is created over it in the form of tiny treelike particles (above right). Cheng's work shows that these "trees" become electrified and are repelled from the hailstone, exploding into myriads of fragments—just the kinds of fragments found in clouds that produce thunder during blizzards.

Not all of Cheng's work simulates purely "natural" events; the mysterious and beautiful images on the bottom right of this page and on the following page

Tiny "trees" of ice form in the frost layer of an ice pellet. In response to moisture and to electrical stress, they twist and turn. Often one will suddenly shoot off, exploding in fragments (below left).

Published for the first time, the photomicrograph (left) shows a frosted pellet 30 times enlarged. As with falling hailstones, the pellet throws off charged ice particles from its frosty surface.

These strings and grapelike clusters of particles containing lead are magnified 160,000 times. The particles, which came from automobile exhaust, serve as nuclei around which tiny ice crystals form.



The interior of an ice crystal, magnified 10,000 times, that formed on the lead particles from automobile exhaust. With enough of these crystals in the upper air, scientists guess, you could start a snowstorm.

are ominous signs of man's unintentional interference with the weather.

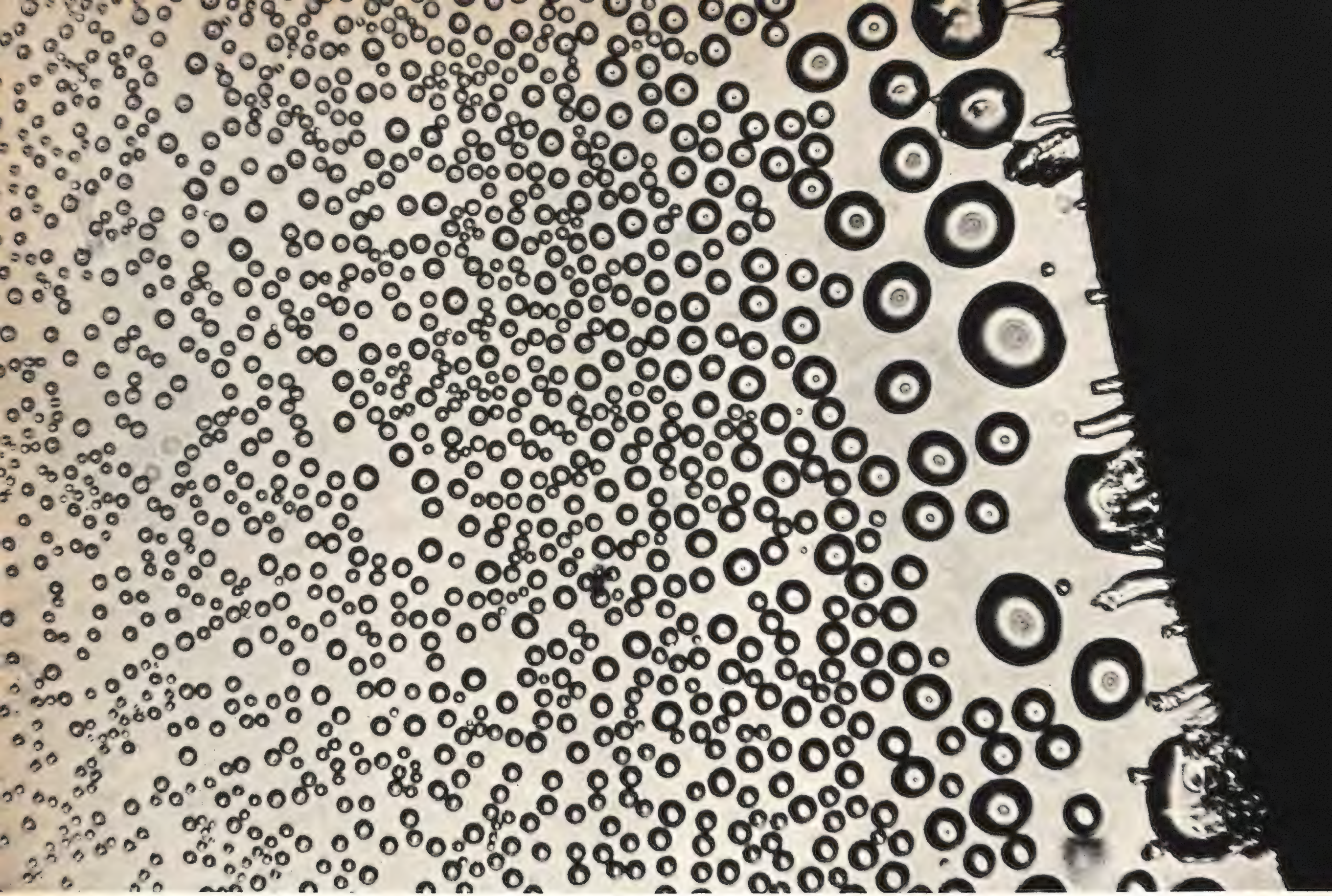
There is a certain amount of iodine vapor in the atmosphere, put there from burning fossil fuels and seaweed and from nuclear plant emissions. By itself, the iodine vapor is largely harmless and of little consequence, but when submicroscopic particles of lead are exposed to a trace of iodine vapor, the lead particles become ideal nuclei for the formation of ice crystals. When enough such ice crystals become diffused in the atmosphere and penetrate certain kinds of clouds, they cause rain and snow.

And where do the submicroscopic lead particles come from that start the sequence? A major source is emissions from cars using leaded gasoline. It may be that unusually heavy rain and snow in the Northeast is the result of this complicated chain of tiny events.

Roger Cheng's photograph (right) shows a drop of water of the sort that wafts up through a thundercloud on updrafts. During the ascent, each drop experiences a very rapid decrease in temperature. The surface of the drop freezes first, then the interior, and (perhaps because the interior water expands as it solidifies) a cascade of microdroplets is forced through cracks in the frozen surface.

The microdroplets, it turns out, carry a positive electrical charge and the parent drop has a negative charge. This phenomenon, multiplied over and over in a thunderhead, may well be what produces its potential for lightning. So even the symbol of godlike displeasure, the thunderbolt, starts small.

First step of a thunderclap: A water drop (dark area) is rapidly frozen as in a thunderhead. Hundreds of electrically charged microdroplets burst through the drop's frozen skin, setting the scene for lightning.



By Terence O'Donnell

The Royal Dublin Society finds virtue in diversification

The organization promotes help for farmers, rewards the inventors, fosters the arts and indulges the Irish passion for horses

If you turn left out of the main gate of Trinity College, Dublin, you will come to a street that leads in time to a part of the city called Ball's Bridge. Here, near the bridge that gives the neighborhood its name, stands a long, gray, pedimented building set back behind lawns and a white-spiked fence. To a stranger passing, the purpose of the building is not immediately clear. It might be a museum or one of the more austere government departments or perhaps a university.

Inside the building this ambiguous quality is even more pronounced. A series of apple-green reading rooms furnished with breakfronts, leather chairs and gentlemen in tweeds might lead one to think that the place was a good club. Across the hall, however, there are rooms which served until not long ago as laboratories for radium research. Next to these there is a concert hall; another room houses a library of 150,000 books, and there is also a sculpture gallery.

Through the sculpture gallery one passes to the building's rear premises. Here amidst hedges, lawns and formal walks there is stabling for 1,500 horses, quarters for a hundred grooms, a field for sheep dog trials, bullpens, buildings for agricultural shows (right), workshops and a veterinary paddock.

This mixture of industry and learning, of sport, husbandry and art, is the Royal Dublin Society. Of all the

Sleek Herefords are paraded before the judges at the Society's biggest event, the annual Spring Show.

Terence O'Donnell is an American who cherishes his Irish heritage even while teaching at the College of Arts & Science at Pahlavi University in Iran.

Drawings by Paul Hogarth

The Society's Dublin Horse Show, held in August, is Ireland's equivalent of the World Series.

world's great institutions, probably only the Smithsonian surpasses it in the sheer variety of its activities.

The Society was founded one day in the spring of 1731 when 14 Irishmen gathered in a room above the gate at Trinity College. Their purpose was to discuss ways by which to remedy the terrible state of Ireland. Economic restrictions imposed by the English, the apathy of a people whom Berkeley called the most supine and indolent in Christendom, the old Irish extravagance of purchasing abroad rather than producing at home—all these had combined to bring disaster to the nation's economy. The place teemed with vagrants and beggars. Bankruptcy was common in the cities, famine in the countryside—and out of panic the merchants and landlords were fleeing abroad. Ireland was the most squalid nation in Europe. These were the conditions that two years before had provoked the Dean of St. Patrick's to make his famous proposal: that the children of the poor be eaten by the rich, thereby reducing the numbers of the indigent and at the same time increasing the food supply.

Unlike Jonathan Swift, the men who met at Trinity were not savage ironists but practical men of affairs. They believed that something could be done. Why not, they reasoned, promote such new industries and agricultural products as would be inoffensive to the English interest and would at the same time replace those commodities that the Irish bought abroad? And why not try to do something to advance Irish science and art, for these, too, could make important contributions to the nation's economy? With these aims agreed upon, the next question was how best to achieve them. Influenced, no doubt, by the 18th-century fashion for learned societies, the gentlemen decided to form themselves into such a body. It would be the duty of each member of the new society to inform himself on some aspect of industry, agriculture, science or art, and then to present his recommendations to the Society, which in turn would endeavor to carry out the proposals.

Within a week the 14 gentlemen had got down to business. Two thousand copies of the most advanced book on plowing were distributed throughout the country. A display of the latest farming implements

was set up and, in connection with it, plowing demonstrations were held in Phoenix Park. A carpenter was even sent to Scotland to learn how to make a new kind of threshing machine. And very shortly, members' papers on various agricultural and industrial subjects —such as the draining of bogs and new methods of dyeing yarn—began to appear with some regularity in the Dublin newspapers.

The Society's activities were broadened and attracted greater attention with the adoption in 1739 of Dr. Samuel Madden's premium scheme. Madden, a Dublin clergyman, hit upon the idea of soliciting contributions for the specific purpose of passing them on as prizes for excellence in what turned out to be a bewildering variety of fields: cider making, statues, house plans, mechanical inventions, paintings, glass, hops and flax, to name a few. A premium was even given to the city of Kilkenny for ridding its streets of beggars (one wonders how). In short, the Society soon became the sponsor of practically every activity and product in Ireland.

No longer a club but an institution

From a small club of civic-minded gentlemen, the Society by the middle of the 18th century had grown into a national institution, deserving of both a Royal Charter and parliamentary grants. With this added prestige and assured financial backing, it substantially increased the scope of its activities. An art school was opened which gave free classes in the fine and applied arts. One of its prize students was James Hoban, now remembered as the designer of the White House. The Society also began to pay more attention to science. Full-time lecturers in chemistry, mineralogy and hydraulics were employed, and a laboratory was set up for their experiments. The library, which contained nearly 5,000 books, was now among the largest in the British Isles.

Industry continued to receive the Society's support through the premium scheme. In addition, retail warehouses were opened for the sale at reduced prices of various commodities. A veterinary school, a factory for agricultural implements and a model farm were established, and land was acquired to set out a botanical garden. Finally, and to round out this picture of an institution that engaged in everything, after the Society moved into its new quarters in Grafton Street, it was said that "every night in winter there is a ball or a party."

With the end of the 19th century, however, important changes occurred in the character of the Society's activities. Government in Ireland, as elsewhere, was beginning to play a greater role in the country's affairs. The question therefore arose as to whether it was proper for government to subsidize a private institution to perform what were now considered to be governmental functions. By 1900 a solution was worked out whereby the Society, in return for various forms of compensation, relinquished those activities which had become truly national in scope.

With these transfers to the state of some of the Society's major programs, it was recognized how great had been its contributions to Irish life. Through its interest in industry and agriculture, science and art, it had created and developed many of what are today Ireland's national institutions: the National Library, the National Museum, the National Gallery, the College of Art, the College of Veterinary Science, the National Botanic Gardens and the Department of Agriculture. The 14 gentlemen at Trinity College might indeed agree that something had been done.

Shepherd

Today this old, distinguished institution moves along with—sometimes in advance of—modern Ireland. Relieved of those responsibilities best borne by the state, it is free in the manner of our own foundations to take up and foster new activities overlooked by or unsuitable for government sponsorship. It has rejected modernity in only one respect—it refuses to specialize.

Originally exclusive in its membership, the Society is now open to anyone upon recommendation by two members, although there is a long waiting list inasmuch as membership is limited. For dues of $12 a year, there must be few institutions that can offer so much.

The Royal Dublin Society

Within its handsome buildings, set in 62 acres of park, there is a yearly program of 24 concerts and almost as many lectures. It was the Society which first brought the legendary British pianists Benno Moiseiwitsch and Solomon to Ireland. Its lecturers have regularly included men like Sir Bernard Lovell on science or the late Frank O'Connor on the short story. For those interested in art there are, besides lectures on the subject, the painting and sculpture competitions that the Society sponsors and the travel scholarships it provides to enable young artists to study abroad.

Up until the last decade the Society's work in science included on-the-premises research. Only five years after the discovery of radium, laboratories were created to study the element. As a result, the Society was for some time the principal supplier of radium to Irish hospitals and doctors. Eventually, however, the expense of maintaining modern laboratories became too great and the Society handed over its stock of radium to the state.

Papers and premiums

Scientific activities now center on monthly meetings at which papers on pure and applied science are read, after which they are printed and sent to other learned societies. It also provides grants to help scientists purchase equipment and materials needed for their research, and sponsors every three years a science exhibit which is the largest of its kind in Ireland. In industry the Society still gives premiums for new inventions and subsidizes country crafts.

The Society's main activity, however, as at the time of its inception, is agriculture—and this is altogether proper. It has been said that the Irish are a tribe. Certainly they have always preferred to graze rather than to till, and often enough to engage in neither activity. They liked far better to tell stories and gallop a horse. The high agricultural production of other small countries, such as Denmark and the Netherlands, excited neither envy nor ambition. An Irish farmer with a bit of money would send his son to a seminary or a university, but rarely to an agricultural college. The memory of landlords and famine, of heartbreak on the land, died hard.

Thus the Society throughout its history has striven to correct this imbalance between a country suited by nature to agriculture and a population indifferent to farming. Whatever was done in the 18th and 19th centuries to encourage sound agricultural practice came from the Society. Its work is far from finished.

Nevertheless, it was the first body in the British Isles to set out, deliberately and on a national scale, to improve by sound breeding practices the country's livestock. This required accurate, permanent records of the pedigrees of animals, records which the Irish farmer did not keep. In 1890, therefore, the Society began publishing lists of pedigreed animals in what was called a herd book. Now three of these—one for cattle and two for pigs—are published annually. And the Society every year holds a show at which bulls and boars are licensed for breeding and cash premiums are awarded to the best. The show is also an auction sale —a sale which usually realizes about $400,000.

Much bigger and much more important, however, is the Society's annual Spring Show. This is both a great agricultural fair and a five-day institute in the latest agricultural methods. The Society's facilities for a show of this kind are among the best in the world and include eight acres of permanent, covered exhibition

Cattle judge

Sheep dog trials

space. The outdoor judging rings are as trim and perfect as the putting greens of some smart country club. There are beautifully landscaped tea gardens, a band lawn, a dozen bars and restaurants. The grandstands can accommodate 35,000. The Society's own railroad siding links up with every railroad in Ireland, and in order to encourage breeders to keep stock of exhibition standards, the Society pays half of the freight costs of exhibitors.

During the Show the Society distributes $15,000 in prizes for the best farm animals and produce. There are sheep-shearing and milking demonstrations, classes in livestock judging, daily lectures on tillage and the care of animals. The mechanized aspects of farming are covered by demonstrations of machinery operation and maintenance and by over 500 industrial exhibits, most of which relate to agriculture.

Horse judge

The Show is also lively entertainment. There are exhibitions of hunting hounds, sheep dog trials, riding events and the colorful Grand March of prize animals. One of the highlights is a supper for all the herdsmen at the Show, at which the Society presents awards to workers who have been employed on one farm for at least 50 years. It is characteristic of the Society that for over two centuries it has been introducing into Ireland the latest in every field and yet at the same time it knows the value of continuity and rewards it.

There is one other activity in which the Society, being Irish, is enthusiastically involved. Ireland may or may not be the land of saints and scholars. It is and always was indubitably the land of horses. Arthur Young, the 18th-century agriculturist, was appalled to discover while traveling through the country that even the poorest squireens kept enormous stables. Yeats, staying at a house in Galway more than a century later, found the footmen literally barefoot but the stables full. Little has changed. Ireland, like any other country—as we have seen—has its National Library, National Gallery and the other usual national institutions; unlike most other countries, it also has national stud horses, for one of which the Irish government—not the richest of governments—once paid $700,000!

The Society has done much to change this national indulgence into a national industry. Four or five times a year, in a rotunda appointed elegantly enough to house a fashion show, bloodstock sales are held. In addition to the $12,000 in premiums given for good brood mares, the sales are of particular benefit to the small breeder who cannot afford to transport his horses to foreign markets. Now, because of the sales, the mountain comes to Mohammed, for buyers from all

over the world regularly converge on Ball's Bridge. Eight winners of the Grand National were bought in the Society's sales ring. The sales bring in about three million dollars a year. It is, by the way, the commissions on these sales, together with the receipts from the various shows, that enable the Society to continue to be self-supporting.

By far the most important equestrian event in the Society's schedule is the annual five-day Dublin Horse Show. In fact, it is—in the same way as our own World Series or the Tour de France—the national event of Ireland. The hotels fill up with people from places as assorted as Galway, Helsinki and Rio. In Grafton Street's dim and casual coffeehouses, as in the Shelbourne Hotel's stately cocktail rooms up on the Green, there is such a rush and racket that one might think the Irish were engaged in yet another uprising. All over town and in the country houses the floors are waxed for dancing. There are those who think that Horse Show Week is Dublin at its best.

The Show itself was begun by the Society over a hundred years ago. Then 380 horses competed, jumping over walls "five feet ten inches, in cold blood, off wet sawdust, in a crowded courtyard." Today, 1,500 horses come to Ball's Bridge and the jumping enclosure is a 15-acre oval as green as anything in Ireland.

The ideal of the whole man

As a spectacle, the Show is one of the finest things in the country. In a special box in the center of one of the seven grandstands, the Society's president and council entertain important guests. Below on the Promenade stroll the world and his wife, as the Irish would say—the women decked out in new clothes and outrageous hats, the men sporting boutonnières and walking sticks. At one end of the Promenade is the jumping pocket, backstage for the Show, where the international jumping teams assemble before entering the field. At the other end, gathered around tea tables, are the ambassadors to Ireland and other special guests. Beyond is the Ball's Bridge skyline of spires and great oaks, below is the enclosure flanked by privet hedges and long beds of summer flowers—a perfect stage and backdrop for some of the great horses of the world leaping the banks, stone walls and water ditches of an Irish hunting field.

The Horse Show, held early in August, brings to an end the Society's year. Activities do not begin again until October—the concerts, lectures and scientific meetings, followed by the bull and boar and bloodstock sales, followed by the Spring Show, and then once again the Horse Show. This year-long program is in itself a kind of microcosm of the Society's history. Now, as in the past, the range of its contributions to national life can be matched by few of the world's private institutions. And as important as the contributions themselves is the fact that the Society preserves in an age of specialization the ideal of the whole man. The care of animals, the enjoyment of art, the pursuit of knowledge, the pleasures of sport—these, in its view, are not the exclusive monopolies of a few but the common property of all men. Like enlightened 18th-century squires and the 14 Irishmen by whom it was founded, the Society sees nothing incongruous in keeping both a good library and a good stable, in hanging pictures in a gallery and at the same time tilling fields. It has not forgotten that the life of a man or of a nation must have variety, balance, usefulness and grace.

Prize-winning boar

Opposite: The Society's lush botanic gardens and greenhouses now belong to the nation.

This jukebox—a 1946 Wurlitzer—not only provided music but a bubbling light show, as well.

Gift of Roth Novelty Company, Wilkes-Barre, Pa.

By Cynthia A. Hoover

Machines that made music without musicians

A current Smithsonian exhibit recalls how Americans have made up for the lack of live music with muscle power and electricity

"A Player Piano is the Heart of a Happy Home" proclaimed an advertisement early in this century, an assertion with which many thousands of people apparently agreed—at least to the extent of going out and buying one. This is an example of the ingenuity that Americans have used to meet the need for music in their daily lives. At various times that need could be satisfied by touring concert artists, local bands and choirs, traveling minstrel shows or the fiddle on the wall. But when talent was lacking and the touring musicians had moved on, Americans turned enthusiastically to machines for their music.

From the beginning, however, the combination of music and machines presented a challenge to the sensitive performer and listener. In 1906 John Philip Sousa predicted that mechanical music would lead to the disappearance of the amateur musician and to "a marked deterioration in American music and musical taste." While he was not totally wrong, many of us who grew up in small communities where few professional musicians appeared, know how important recorded music, radio and the movies were in introducing music into our lives—and even spurring some of us on to lives in music.

"Music Machines—American Style," an exhibition currently at the Smithsonian's Museum of History and Technology, pays tribute to this phenomenon.

Cynthia A. Hoover is Associate Curator of Musical Instruments, Museum of History and Technology.

Gift of Oliver Read

Ancestor of the jukebox, this was the first selective coin-operated phonograph. It held 24 cylinders.

Frances Densmore, who collected American Indian songs, conducts a recording session outside the Smithsonian "castle." Until 1925 all recordings were made by the acoustic process—with no amplification or volume control. This meant that musicians had to play or sing directly into the recording horn.

Warshaw Collection of Business Americana

19th-century boy with a 19th-century music box—one of the earliest types of mechanical instruments for the home. Its tinkling tunes were produced by a rotating metal cylinder studded with pins. The pins plucked a metal comb as they passed by.

Gift of Princeton University

Edison's Speaking Phonograph of 1877—"It talks. It whispers. It sings." One talked, whispered or sang into the mouthpiece while turning the crank. Though miraculous, the sounds reproduced on the tinfoil cylinder were parodies of the original.

Since most manufacturers were unprepared for the sudden popularity of radio in the early 1920s, many receiving sets were made at home. This simple crystal set could be assembled from pieces of wood, wires and an old Quaker Oats box, according to instructions from the National Bureau of Standards.

Gift of Leonard G. Shoemaker

Edison phonograph (1907) with a painted morning-glory horn, tripod and cabinet for 100 cylinders. Believing in the superiority of cylinder recordings, Edison continued to produce them until 1929. But the public had long since switched to disc records.

First manufactured in 1909, the Violano-Virtuoso was a self-playing violin and piano combination that was popular into the 1920s. Activated by perforated rolls, its selections could range from popular tunes to classics like Beethoven's Violin Concerto—quite a *tour de force* for the mechanical violin.

Spiders—feared, revered and loathed the world over

An admirer turned camera buff records the odd and lively habits of these fascinating and ubiquitous creatures

Article and photographs by Ann Moreton

EDITOR'S NOTE: Ann Moreton was hooked by a cobweb in the Virginia grass. She saw a spectacular one sparkling with morning dew and, thinking a picture would be a nice decoration, tried to photograph it. The result: a failure. Later she surmised the reason was technical—the dew evaporated before she got her camera, leaving the silk strands almost invisible. But be-

Goggly ogler sitting on a leaf, *Phidippus audax* has eight eyes (four visible here, seemingly ringed with reflected light). Less than .7 inch long, this jumping spider actively stalks its prey, pouncing on it from an inch or more away. Most species lie in wait on their silken webs which trap insects.

fore she learned the lesson of rising before the dew is off the web, she decided that a little knowledge about the life-styles of spiders might help. The ubiquitous nature of spiders, their myriad forms and varied habits became a passion. When she told her son she planned to track them down in every state of the Union, he said "Mama, you've gone off your rocker." But off indeed she went, in a camper, seven years ago. Now her pastime has become a profession; she lectures and has co-authored a book to be published next year. From her photographs, which go on display at the National Museum of Natural History this fall, and from her lecture notes comes this spider sampler:

Spiders live all over the world. They have been found by climbers on Mount Everest, by fishermen five miles at sea and by aviators a mile in the sky. One air-breather lives under water. Other spiders live in silk cocoons like those of caterpillars, others reside under stones and in subterranean caves. Some mimic ants, sharing their burrows and holding their legs up like antennae. Flower spiders change color to match the blossoms on which they rest and snare prey. About 30,000 species have been named and some scientists believe a like number remains to be identified.

The external skeleton of a spider's body is divided into the cephalothorax and the usually larger abdo-

men. They have four pairs of legs and usually eight simple eyes. Yet in Panama forests one spider has a single pair of eyes and cave spiders have none. Of the several-eyed species, some see poorly while others have keen visual acuity. They can hear and many have a superbly developed sense of touch.

Like insects and crustaceans, spiders belong to the phylum Arthropoda. But with scorpions they share a distinct class: Arachnida, which is named for the mythological maid who challenged Athena to a weaving contest. Arachne lost and the goddess changed her into a spider, dooming her to spin forever. Spiders constitute the zoological order Araneida.

Depending on the species, spiders spin silk into tangled webs, sheet webs, tube webs, nursery webs, orb webs, "the bowl and doily" and other forms that are used variously to live in, to catch prey or to succor young. The most beautiful and often seen is the orb, a web made of at least three kinds of silk. The strongest is used for the guy lines which support the web's weight. The radiating lines are made of a lighter, dry silk while the circular lines (the actual snares) are beaded with tiny drops of sticky secretion.

Spiders manufacture fibroin internally. As the clear, fluid protein is pulled from the spinnerets between the hind legs, stretching action hardens the fibrous fluid to form silky threads. I once collected spider silk for Chemstrand Corporation scientists who reported it is as much as 30 percent stronger than nylon. Spiders use their silk for draglines, traplines, ballooning lines, attachment disks, anchor lines, molting threads, egg sacs, mating bowers, entangling sheets, swathing bands, swathing film and escape lines.

Some spiders spin a solid hub on which they rest; others use a few scattered lines with large openings between them. *Micrathena gracilis,* a spiny-bodied species, cuts a small round hole in the hub and hangs

Desiccated insect corpses and the weaver's cleverly camouflaged eggs look alike in this orb web of a *Cyclosa,* which was found near the author's home.

Having already molted once in their egg case, newly hatched *Nephila clavipes* swarm on a nursery web.

Spiney-bellied tree dweller, this *Gasteracantha* species with its distinctly armored abdomen, spins a specially tufted orb in subtropical Florida trees.

A female wolf spider carries her young on her back. When they need to drink, she puts her front feet in water and they run down her legs. Egg yolk in their bodies provides their first form of nourishment.

Air-breathing but aquatic, fishing spiders *(Dolomedes fimbriatus)* sometimes eat tadpoles and tiny fish.

head down in the open space. Some orb spinners live in folded leaves at the top or side of the web. They keep in touch with the net by resting their front feet on two traplines running to the web's hub, as one would hold the reins of a horse. When an insect becomes ensnared in the orb, many spiders run out on the web, fasten the prey with new silk and kill it with a venomous bite. Then they secrete digestive juices into the corpse and suck it dry, leaving a crusty skeleton. One species spins a small web and actually throws it over its prey.

For men, mystic messages and meals

Legend, poetry and song proclaim man's fascination —and sometimes reverence or fear—for spiders. As recently as the 1930s, spider divination was practiced in the British Cameroons where every family head had at least one large hairy *Neteroscodra crassipes* to determine the gods' will with the help of 200 cards made from African plum-tree leaves.

Spiders have been used medicinally for centuries and pills made of house spiders were widely recommended for fevers in England. Dr. Watson's 1760 recipe called for "swallowing a spider gently bruised, and wrapped in a raisin or spread upon bread and butter." While spiders are not widely consumed by man, they are eaten in southeast Asia, South America and India. William S. Bristowe, an English naturalist, reporting on *Nephila maculata,* a large orb spider, said: "Sometimes [Laotians] will pick these out of their webs, pull off their legs and eat them raw. But it is more usual to roast them. When dipped in salt the abdomen has a not unpleasant flavor which reminded me of raw potato and lettuce mixed." Dr. Richard S. Cowan, director of the Smithsonian's National Museum of Natural History, says that roasted spiders he

Agelenopsis pensylvanica guards the entrance to its funnel web. This species has very poor vision.

Tetragnatha, a slender-legged orb spinner lives near water—and can walk on it. Incongruously, this individual poses on a budding rose.

A *Dolomedes triton* carries an egg sac. She goes without food for about two weeks, spins a nursery web for the sac and guards it until the young hatch.

has eaten "tasted like crab meat and were delicious."

The sheet webs of funnel spiders *(Agelenidae)* are found all summer on the ground, in stumps, draped over shrubs, in stacks of lumber and inside deserted houses. Returning from a lecture tour several summers ago, I found a spectacular three-foot web in my kitchen. At first I thought the spider might starve in the house, but feeding turned out to be a simple matter. I helped my guest by propping open a couple of doors at night and turning off all lights but one; moths were attracted and trapped in the web.

Another spider who lived in my fireplace for three months was great entertainment for dinner guests. Every night around 7:00, *Neoscona* would come out of a crack, spin a 22-inch orb web by 7:45, and hang in the center waiting for food. I always had a moth or cricket to throw in the web; she would wrap it up and eat it later. In the morning the spider would invariably eat the night-old web—all but the guy lines—in less than five minutes.

Special webs for mating and for young

The trap-door spider attaches a hinged silk lid to the top of its tubular residence. Hunting crickets for my tarantula, I once turned over a bale of hay and found a magnificent trap-door spider almost the size of a marble. I dug its damaged tube out of the ground and transferred it to a coffee can filled with dirt. When the spider was placed next to the tube it disappeared inside. Next morning a lovely new silk door was attached to the top of the tube.

I hunted six years before discovering the sperm web of a male spider in a weedy field where hundreds of banded garden spiders *(Argiope trifasciata)* hung on webs. Attached to one female's web I found the two-inch sperm web on which the male deposits a reservoir of semen. He then takes up the semen on his palps, the modified appendages between its forelegs, and couples with the female.

Some nursery web spiders live near water. I was delighted to find a beautiful specimen, *Dolomedes triton,* sitting on a lily pad in Mississippi holding her egg sac in her jaws. After a hairpin's persuasion, she ran into a jar. For the next ten days she did not take food or water in the dishpan where I'd placed her along with a bushy branch for a hiding place. On the eighth morning the baby spiders left the egg sac which she'd placed inside a nursery web, a woven enclosure surrounding the sac itself and a generous space. The mother sat at the bottom of the branch outside the nursery, her front feet touching some lines. After the spiderlings hatched and began feeding on snared fruit flies three days later, the mother died with her feet still on the lines to the nursery above.

Housewives detest house spiders *(i.e., Achaeranea tepidariorum)* and the insect carcasses that fall beneath their dusty, tangled webs. But these creatures serve a useful purpose. In its lifetime of a year, each one kills about 2,000 flies, mosquitoes, moths and other insects. In Florida, one variety of house spider is welcomed because it eats roaches.

Of the many thousand species in the United States, only a few are dangerous to man—notably the ubiquitous black widow *(Latrodectus mactans* and perhaps a close relative) and the genus *Loxosceles,* especially the brown recluse of the south-central states. Bites from these spiders are sometimes fatal, especially to infants, elderly persons and individuals with an allergy or diseased liver. Moreover, the bites of these spiders are very painful and require medical treatment.

The U.S. Army once used the silk of the black widow for gunsights, and other spider silks are used in surveying instruments. Several years ago a well-known violinist requested spider silk for violin strings. Many primitive societies use the material in a variety of ways, such as the New Guinea natives who make the golden silk of the *Nephila* into fishnets. Other spider silks are said to be used by these natives for caps so durable they last a lifetime. The first see-through dresses may have been worn by dancers in the New Hebrides whose costumes were made of webs collected on special conical forms. In 1709 stockings and gloves of natural spider silk were exhibited in Paris.

Four years ago the children in my neighborhood heard about my spider hunts and asked to go along. So the National Arachnid Society was founded, with ten children as charter members. Today a thousand members represent the 50 states. There are no dues as such; each member collects six spiders a year, which are preserved in alcohol and sent to a university museum for research.

It is my hope that the natural curiosity and boundless energy of young people might be channeled into some useful spider project. Today, teachers more frequently include the study of spiders in science curricula as their ecological importance becomes more appreciated. Meanwhile, a project awaits some araneidophile in Georgia: In the mid-18th century an English artist named John Abbot painted almost 600 species of spiders that were discovered in the then-colony. The paintings are now in the British Museum and could be used as a basis for comparative study. How many of those species are still with us? Or have pesticides decimated Arachnida too?

A spider of the genus *Theridion* (the second largest group) hoists a caterpillar two inches to its web. It kills prey with a venomous bite, injects digestive juices and sucks the carcass dry.

An orange-kneed tarantula abandons its outgrown skin (right) after molting. Some females live 20 years.

A crab spider (*Misumena asperatus*) feeds on the hornet fly that mistook it, perhaps, for bird droppings. This spider turned yellow after perching on the flower seven days, and white again in five.

By Nan Lawler

Black widow: semi-myths

Does she consume her mate or not? Only sometimes, a Santa Barbara natural history technician observes

The first rule for survival in the spider world is: If it moves, taste it. Spiders, having no religious or moral scruples, occasionally eat one another. Potentially, a moving spider is every bit as edible as a moving fly.

This can cause some serious problems when it comes to continuing the species. The male is generally smaller—sometimes spectacularly smaller—than the female.

It is not fair, true, but, biologically speaking, the male is not nearly as important as the female. Once mating is completed, the male is of utterly no use to future generations. An active Masculine Liberation Movement in the spider world might change this. But until that happens, courting can be a dangerous undertaking.

In the meantime, the male has had to develop all sorts of interesting ways to signal to the female, "Hey, babe, how's about it?" and, simultaneously, "I want to be your lover, not your dinner!" Fortunately, females tend to be quite chivalrous about not attacking signaling males. As a matter of fact, if a thorough survey were made, it would probably show that few males are actually eaten by their mates, in the wild at any rate.

Take, for starters, that old husbands' tale about the black widow always eating her mate. That is a lie. She only eats him if she is hungry.

Her behavior, even in this case, is not really so outrageous. Consider for a moment the reaction of a human female if she were invited out to dinner and her escort announced that rather than going to the restaurant for that chateaubriand, they go by his place instead for a little lovemaking. An outraged reaction would be understandable.

There is one spider, a European (naturally), which foresees this difficulty and takes the precaution of first presenting the female with a neatly wrapped insect, saving the candlelight and soft music for after dinner, so to speak.

But the fact remains that even without such a nice touch, the black widow does, in exceptional cases, eat her mate. For the spider at least, these exceptions seem to have a definite survival value for the species. If a male cannot tell the difference between a female starving for love and one who is simply starving, it is probably better that his genetic material be digested rather than passed on to posterity. A generation of stupid spiders would not do the species any good.

In the wild—and for black widows "the wild" means your basement or garden—males are often found in the webs of females. If you can restrain the urge to kill and instead observe them for a while, you will find that the male will stick around for a few days and then disappear. Probably *not* into the stomach of the female. More likely he has just wandered off (as males often do) to another conquest. The female does not seem to care; she will have other gentlemen callers. It is rarely a "till death do us part" sort of thing with black widows. Unless, of course, constancy is strictly enforced. Inside a jar, for example.

I kept one black widow couple that lived together for five presumably happy months in a quart jar before the male was found neatly bound up and apparently eaten. (Let us not point any fingers; some of the couple's offspring were large enough to do in Papa by that time.)

But think about it: five months in a quart jar. Translated into human terms, it is remarkable—the equivalent of confining a human couple to a 15-by-16-foot room. Odds are they wouldn't last five days, let alone five months. And the spiders lasted the equivalent of 15 years! Far from being part of a horror story, the black widow is, in fact, a shining example of marital bliss.

Probably the most ferocious spider of all is one quite absent from our folklore. This is the Mimetid. Mimetids do not eat spiders occasionally; they eat them regularly. Some authors have gone so far as to say that Mimetids dine exclusively on other spiders. This makes romance particularly difficult.

The male does not want the female to mistake him for a food spider, so he has a rather elaborate little ritual, a definite rhythmic tapping or plucking of the silk strand on which she hangs. As the tattoo progresses the female appears to fall into a passionate trance, whereupon the male completes the mating process and clears out in a hurry.

Many observers have watched jumping spiders signal each other for hours. Like other spiders with good eyesight, jumping spiders put on a very nice visual display involving waving legs and pretty little dances. Males will perform for hours while the female plays hard to get and goes about her business of grooming herself or eating.

This is not always the case. One female wolf spider of mine lived for months with a male in a shoebox, and she signaled to him regularly. The idiot never responded. There are few things sadder than a female crawling the walls (literally in this case) because of some dumb irresponsible male.

Mrs. Moreton has photographed a female black widow with egg sac (opposite page). Above is a male black widow.

By John Neary

Official historian —at age sixteen

Garry Douglas, the nation's youngest official historian, researches to prove that his village can make a claim to be the nation's oldest

Garry appraises a mannequin displaying yesterday's fashions in the Waterford Historical Museum, an old village mansion that he helped to restore.

His elders in the village of Waterford, New York, hardly ever ask young Garry Francis Douglas silly questions like, "What are you going to do when you grow up?" Not only are such inquiries put off by the fact that at 16 Garry looks, acts and speaks as though he were much older, but he is usually far too busy—doing precisely what he intends to keep on doing for the rest of his life—to waste much time on such patronizing questions in the first place.

Folks who live in the forested, history-shrouded Hudson and Mohawk River valleys around Waterford have become accustomed to finding this not-very-tall, plumpish, bespectacled and owlishly solemn young man peering intently at old masonry, inspecting cornerstones, trudging the canal towpaths that lace weedy banks, and creeping through the old graveyards that dot the area. They know he is just studying the relics that they themselves take so much for granted. They are even used to seeing him, attired not in the tie-dyed costume of his generation but in a sober business suit, at village board meetings.

More than mere passing curiosity accounts for Garry's presence in these unlikely places; he is the official historian of this pleasantly timeworn hamlet near Albany. And the residents of the area treat him with the same seriousness that, they have come to realize, Garry brings to his work. Hardly had he been appointed to his position by the mayor and the village board in January 1970 than Garry set out to confirm a suspicion that some village residents had long held but none ever succeeded in proving. Waterford had always been acknowledged to be the oldest continuously incorporated village (as opposed to towns or boroughs) in the state; could it be, Garry wondered, that it was the oldest in the *nation?*

There are of course, Garry realized, settlements, towns and villages whose existence can be traced back to the very dawn of colonial times—and Indian pueblos predated the arrival of European newcomers by centuries. None, Garry suspected, had been officially chartered by any government before Waterford. The technicality intrigued the young historian.

Working on weekends—his classes at the Albany Academy left him little evening time—Garry wrote letters of inquiry to historians in the 14 other states admitted to the Union before Waterford was incorporated in 1794. As the responses trickled in, each reporting no older villages, Garry's hope mounted until finally, on July 14, 1970, just hours before the village board meeting, the last state was heard from. Kentucky, reported the librarian of the state historical society, had no incorporated villages established before

John Neary, former Life *writer, is now a senior editor of* On the Sound *and author of* Julian Bond. *His wife Joan took these pictures.*

1794. Waterford could claim to be the oldest in the country, Garry told the board.

Having thus whetted Waterford's appetite for news about its past—and exhilarated by the interest he had aroused—Garry set himself another project. He began work on a slide show about the village titled, "A Second Look." He shows it to groups in town, talking with conversational ease about the old buildings and canals and graveyards he has photographed himself and about the people they served: the man whose neighbors scoffed when he built a solid concrete home, calling it a "mud house," and predicting it would soon collapse; the Peebles family "so wealthy it came to this country in its own ship"; the robber who was acquitted after he feted the judge and jury—with the proceeds from the robbery; the bridge keeper who tried to levy tolls on the advancing U.S. Army for crossing on its way to Canada in the War of 1812. It is a show, Garry says, "For Waterfordians, people who pass these buildings and who usually don't think anything except, 'Gee, *there's* a nice old house!' I'm trying to remind them of their heritage."

Garry turned to history, his parents say, as he was growing up on Fonda Road on the outskirts of town, a two-lane blacktop down which armies marched in colonial days—along which playmates were scarce for an only child. Garry found his adventure and excitement in the past. When he was just 11, his father Gerald Douglas, principal of the elementary school, and his mother Joyce, the town assessor, joined with a determined group of their friends to save one of the prettiest old homes in the area. The house, built in 1830 by Hugh White, was about to be razed to make room for a supermarket. The store offered to give the old mansion away if enough money could be found to move it. "Raising $11,000 in a town this size was quite an undertaking," Garry's father recalls. "We had a house-to-house campaign, knocking on doors, and then we hit the area's businesses." In the end, the mansion was saved—and became a museum.

Village records lost in fire

Nowadays the keen pride felt by those who worked to save the building is shown in little ways: turning out to spend a Saturday working on the grounds or in refinishing the interior. Mrs. Douglas smiles as she says, caressing a banister, "Gerald and I did this railing."

Her son, who helped out on the fund-raising, is now working to increase the museum's stock of lore about the village. The quest is far from an easy one: Most of the original buildings have either collapsed from age or were destroyed in a fire in 1841; vital records were all lost in another fire in 1914. The only written information is one privately published volume, *History of Waterford,* written with affectionate zeal and scant style in the 1950s by the late Colonel Sydney Ernest Hammersley. Lacking other basic source material, Garry has found himself doing a lot of plain old-fashioned legwork—which on occasion has startled a few people. One woman, finding him prowling through a swamp behind her house in search of a graveyard that Hammersley wrote was back there somewhere, summarily ousted him.

Garry's schedule is as crowded as that of the village fathers with whom he sits at monthly board meetings: From six in the morning until he returns home at 7 P.M., he is in uniform and busy with school affairs at the Albany Academy where he is an honors student. Garry will be a senior next year. After school hours, history leaves little time for what he calls "extracurrics," but he was one of the few volunteers who worked at Nixon headquarters in the last presidential election—and he maintains a constant campaign of his own to add to his growing collection of political memorabilia (he has more than 100 different Nixon buttons). So far he has collected the signatures of some 60 Senators and Governors, and is proudest of the autographs of Woodrow Wilson and Everett Dirksen.

Teen-aged antiquarian

Also, he is starting work on finding out about famous Waterfordians; an inquiry into the life of Howard Lindsay evoked replies from Jimmy Durante, Estelle Parsons and other acquaintances of the playwright. They sparked thoughts of doing a biography.

Garry's office—taken over from his father—occupies a quarter of his family's paneled basement where Garry works, appropriately enough, at an antique roll-top desk found in an old Waterford house. A typical week's schedule: Monday, political rally; Tuesday, a visit to a woman to view her collection of historic photographs of old Waterford; Wednesday, a history seminar at the museum; Thursday, another visit to another Waterford grande dame to examine her house deed for possible clues to the village past; Friday, a visit to a man who says he has some "old writings" about the village's early days; Saturday, a photocopying session of old pictures and a museum meeting.

With schoolmasterish detachment, Gerald Douglas says of his busy son, "I think this has given Garry an outlet, and given him some recognition—something everybody needs—and, he's taken very nicely to speaking before groups."

For Garry himself, talking about why he is a historian is not at all as easy as telling people about his discoveries. "I enjoy it," he says. "It's really not a job—it's a unique opportunity to do something that somebody really enjoys doing." Musing on how he decided he wanted to become a historian, Garry simply cannot recall ever having wanted to do anything else and will turn inquiringly to his mother and ask, "What *did* I want to do? Nothing really solid." Now, he states, he does it because "I just enjoy doing what I'm doing."

"Tell about your dream," his mother urges, and Garry talks about his favorite place in Waterford—Peebles Island, a weedy jungle of a place in the middle of the Mohawk River. Now Peebles Island is the site of an old fabric-bleaching plant, but hidden in its long grasses and undergrowth are eroded earth breastworks and Indian artifacts. (Since long before explorers came, Peebles Island has been a natural place for a

In about 1859, this plant lit the streets with gas made from sawdust, rosin and a secret ingredient.

"Mohawk" hydrant was made at Eddy Valve Co.

Cement residence (right) was scorned as a "mud house."

Waterford, founded as Half Moon Point in 1630, claims its 1794 charter makes it the earliest of any continuously incorporated U.S. village.

fort.) Garry, his mother says, likes the island so much because "he likes old things, and I think he kind of relives it, kind of dreaming of the 'days when.' " But now Peebles Island stands threatened by the approach of a new state highway. While many in the village are apprehensive of the intrusion, Garry would like to see the road provide public access at last to this favorite spot, and create a state park.

It will make, he thinks, another good project to work on, along with the booklet he is preparing on Waterford history and his work on the bicentennial committee that is already making plans for how Waterfordians will mark the anniversary of the Revolution that once swirled around them.

Much as Waterford might seem just another pretty little town discovering that its children all want to leave, Garry feels he has a lot more to do here. With the marvelous certainty that is possible at 16, Garry is positive that after college, where he plans to study architectural restoration, he wants to spend the rest of his life right here, pursuing his romance with Waterford and its secrets.

Tours for Associates

Tours are planned for members of the Smithsonian Associates. For information write: Smithsonian Reception Center, Great Hall, Smithsonian Building, Washington, D.C. 20560.

Foreign Tours

"No-Tour" Tour: Round trip from Dulles International Airport to London. Members arrange their own travel in Europe—September 9-30.

Soviet Union: An unusual tour that includes Samarkand, Kiev, Vladimir and Novgorod. Second section —October 25-November 19.

Tours—1972
Mexico and Guatemala: A visit to historic sites of Yucatán, Oaxaca, Mexico City, Tikal and Antigua—January 3-22.
St. Croix and Puerto Rico: A study of early Danish architecture and historic areas—February 1-14.
Australia and New Zealand: The tour will go out via Fiji and return via Tahiti with visits to Canberra, the Australian Outback, Great Barrier Reef, Tasmania and Christchurch—Late March-April.
"No-Tour" Tour: Dulles International Airport to Paris—May 29-June 19.
Greece and Yugoslavia—June 15-July 8.
"No-Tour" Tour: New York to Frankfurt—July 3-24.
King Arthur's England—July 12-August 2.
The Pilgrimage Road (France and Spain)—September 11-October 9.
"No-Tour" Tour: Dulles International Airport to London—September 11-October 2.
Pakistan and Afghanistan—October 10-November 15.

Domestic Tours

Photography and Nature: A tour of Moosehorn Wildlife Refuge in northeastern Maine, with advice on photography—September 7-12.

Hudson River Palisades and West Point: A visit to the Van Cortland Mansion, Hyde Park, the Vanderbilt Mansion and a tour of West Point Military Academy—October 15-18.

Everglades National Park and Pennekamp Coral Reef: A study of the geology and ecology of the park, following nature trails to view unusual plant and animal life and a visit to the 70-mile coral reef—November 9-14.

By David Snell

Rothko Chapel– the painter's final testament

An ecumenical chapel built around a major American artist's last big commission provides an oasis of stillness in bustling Houston

There are aspects of agelessness about the Rothko Chapel which stands in silence in its Houston, Texas, minipark like some temple of a vanished civilization (see page 55). Only by subtle things—the dank and acrid aroma of concrete not fully cured, the frailty of the sod tufts in the instant lawn—are you reminded that this remarkable edifice, like so much else in this city, is of recent creation.

But Houston, which prides itself on being among other things the air-conditioning capital of the world and whose brashness is built upon the collective Midas touch of its citizens, rarely takes the time to contemplate subtleties. In Houston as elsewhere, it sometimes takes a stranger to sort out perspectives.

On one recent hot summer's day a stranger did come, the Vienna-born wife of the photographer, Yoichi Okamoto, who took the pictures shown on these pages. While he went about his assignment she sat quietly on one of the rough timber benches inside the chapel. Like others who floated in from time to time, she would spend long minutes staring at first one and then another of the 14 huge, dark, almost featureless canvases enshrined in the eight-sided chamber as the last and greatest commission of the American abstract painter Mark Rothko.

Finally, as the shadows deepened and the high,

David Snell is a free-lance writer who now lives in Houston. He was formerly on the New York World-Telegram *and was a writer-editor for* Life.

Reactions to the chapel vary: Some people pray, some scoff, some find it a quiet place to read.

Color photographs by Yoichi Okamoto

The chapel is furnished only with wooden benches and the brooding presences of the Rothko paintings.

vaulted skylight grew dim, she emerged from the coolness of the chapel and walked to the edge of the reflecting pool to gaze at the chapel's companion work, an angry and monumental sculpture called *The Broken Obelisk* by Barnett Newman, who died suddenly last year, a few months after his friend Rothko.

All day the towering work had been storing up heat. Though the waning of the afternoon had brought relief, you could still see updrafts of thermal currents from its rusted facets. Mrs. Okamoto turned toward the chapel, a serene building with geometric expanses of windowless brick that looked as impregnable as the battlements of Carcassonne.

To a person who is truly Viennese, as to a true Parisian, Roman or Florentine, a city is always a living entity, accountable in a kind of personal way for all things which comprise its history and contribute to its character. Mrs. Okamoto turned her thoughts to the accountability of Houston.

"You know," she said to the writer, who had joined her at the pool, "For all my feeling of amazement over Houston and its space program, I have bitterly resented it for robbing us of the mystery of the moon. But now, with this—" she nodded toward the Rothko Chapel—"Houston has repaid us with a new mystery. I think now I can forgive it for the moon!"

The question of whether Texas' largest city, as a kind of supersized collective noun, can take all the credit for such a mystical trade-off is a subject for debate. NASA's Manned Spacecraft Center is not actually within the Houston corporate limits, and the Rothko Chapel has not yet become a mass-based community enterprise to any resounding extent.

Up to now Houston's prestigious and strong-willed art patrons, John and Dominique de Ménil, have largely supplied the inspiration and financial support for the chapel. The money has been channeled through the Institute of Religion and Human Development, itself heavily supported by the de Ménils. The initial cost of the chapel came to $702,800, including the $250,000 commission for the paintings. An additional $1.5 million is being sought from private subscription to create a perpetual endowment for maintenance. About $200,000 of this has been raised so far. The de Ménils hope the rest will not prove too difficult; a successful subscription, they firmly believe, is a form of civic discipline, essential to the community's sense of participation.

The $90,000 cost of the Barnett Newman sculpture was a separate item. It has proved an embarrassment—and so sore a point within the city government that the official attitude toward the chapel is one of nonrecognition.

To encourage Houston to acquire a major work of sculpture to be placed on permanent view outside City Hall, the National Endowment for the Arts two years ago had offered a grant of $45,000, to be matched locally. Mr. and Mrs. de Ménil agreed to put up the matching sum on condition that the selection be Newman's *Broken Obelisk,* which was then temporarily on display in Washington.

The city fathers had no particular objection to the sculpture. But for an administration with no love for civil disobedience there was a shocker: The de Ménils proposed to dedicate the obelisk to the memory of Martin Luther King. On this note the City Council rejected the de Ménil money.

Rather than retreat, Mr. and Mrs. de Ménil decided to put up the entire $90,000. They bought the Newman obelisk, brought it to Houston and installed it in the reflecting pool in front of the chapel—as a monument to Dr. King.

Just how deep was City Hall's discomfort over it all became apparent at the dedication ceremonies for the chapel last February 27. In the world of art the opening was a major event. Illustrious personages of that world converged on Houston along with an ecumenical spectrum of religious leaders. Among the latter were the chairman of the Central Conference of Rabbis, an Imam of the Islamic faith, several Protestant bishops including a representative of the World Council of Churches, a Bishop of the Greek Orthodox Church and a Roman Catholic Cardinal who flew in as the personal emissary of the Pope.

The Mayor of Houston had been formally invited. Under other circumstances he might have showed up with glad hand extended and keys to the city ajangle. But he chose not to attend—aware, no doubt, that his presence might place him literally and symbolically in the very shadow of that upside-down, misdedicated shaft of sculptured iron.

After that the Rothko Chapel settled easily into a routine. Mainly it was a place just to go and be in, with no formality or strings attached. Each day anywhere from 30 to 150 people would come, look around, perhaps linger awhile, then leave. Young people seemed to feel more at home than their elders. Frequently a practitioner of Zen Buddhism or Yoga would show up and put himself into a trance, or the Lotus position, or both. On one occasion a teen-age couple stood awhile under the speculative eye of a guard, then pronounced themselves man and wife.

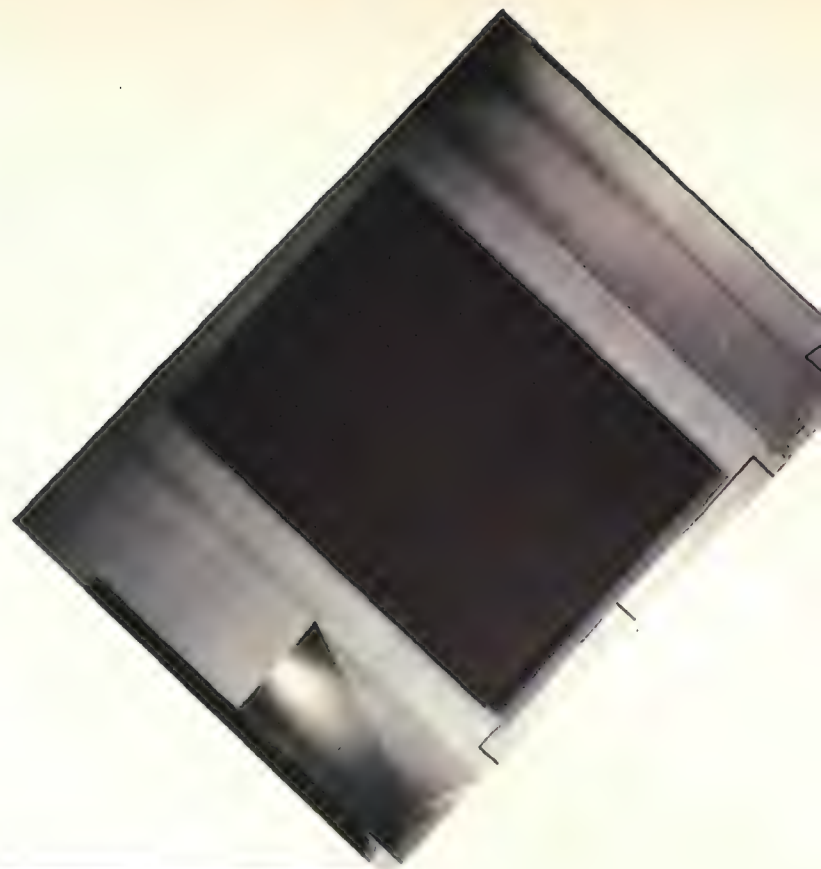
A reconciliation of art and religion

Predictably, the chapel drew doubters. "You gotta be kidding!" was a frequent comment. Some people would look around and ask a guard where the paintings were. But for every visitor who came to pray but remained to scoff, as it were, there were others who plainly were awed or overwhelmed.

In retrospect, Mr. and Mrs. de Ménil often pondered the events of the dedication and its many levels of significance. While ecclesiastical commissions in art are uncommon in modern times, there had been some notable undertakings in that area by European artists —Matisse, Léger and Cocteau—with extraordinary results. Even so, the Houston experience was unique.

For one thing, it marked the first time in perhaps 400 years that a religious commission of this scope to a major artist had brought about such a degree of concurrence between art and architecture. This is not to say that there was all that great a concurrence between artist and architect. In fact, at the beginning things went badly. The original architect, Philip Johnson, planned to cap the chapel with a truncated pyramid. Rothko, wanting the same illumination he had worked under in his studio, held out for a skylight. When an impasse was reached, Johnson resigned and the Houston architects Howard Barnstone and Eugene Aubry took over. They stuck to Johnson's floor plan—inspired by an 11th-century baptistery on the island of Torcello—but gave Rothko his skylight.

The chapel was an important step toward the reconciliation of art and religion, even though it represented a momentous departure from accustomed forms of ecclesiastical art. Here was a total break with iconography and representational concepts of the Divinity. Rothko's brooding abstractions, drained of form and subdued in pigmentation, marked a return to what is



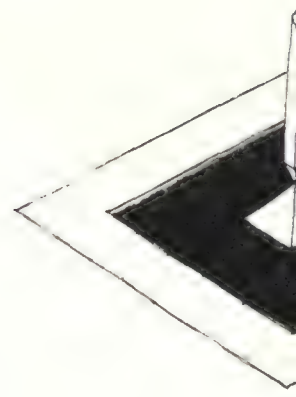
a considerably older idea—the unknowability of God.

Did Rothko intend precisely this? Here we are close to the heart of the mystery. For years people have been reading religious meaning into his paintings. But Rothko, who embraced no dogma and professed no God, was willing to let people see what they wished to see. If he ever brought up content or meaning, he would do so in the form of a question. "Is it *there*?" he would say, and then: "Is *it* there?"

In the nightfall of his life Rothko's paintings seemed to enter a twilight of their own, sometimes darkening like dusk, sometimes awash with warmth like the afterglow of a sunset, sometimes muted as though the shade of death was passing before them. One cold day in February 1970, alone in his cavernous Manhattan studio where his last and greatest commission had been completed and the fires that drove him had gone still, Rothko slashed his wrists.

Speculations about Rothko's intent are anathema to John and Dominique de Ménil. As people of erudition, discipline and authority in the world of art, they know better than to try to put into words what Mark Rothko sought to convey on canvas.

Mrs. de Ménil does, however, take issue with pessimistic interpretations such as those of the critic Emily Genauer, who found the chapel a place of "Instant Gloom," filled with a "black, unbearable nothingness" from which she longed to flee. Mrs. de Ménil expressed her own feelings as we sat in the chapel at sundown—



Fourteen paintings, some of them in groups of three, hang on the chapel's eight walls. The triptych at the top, also shown on pages 48-49, is in the niche across from the entrance (see drawing). The only colors are somber, muted reds and slaty blacks.

the most favorable hour for viewing the paintings, which seem to take on a supernatural glow in the day's fading light.

"I know that some people are distressed because they find them dark," she said, "and they are the people who always associate darkness with something malignant. These are paintings of silence, and you know it's difficult for people to accept silence if they don't like to be confronted with themselves. It is better perhaps to look at the paintings as the obscurity of God, the silence of God. I myself feel no anguish here at all, nor anything disturbing, distressing or sad."

A few days later I sat with her husband in the family's airy and spacious home—designed by Philip Johnson—in Houston's elegant River Oaks township. I asked whether he had ever heard Rothko say anything about intent. "No," he said quietly, "Rothko talked a good deal about the chapel commission but never in an analytical way. And I don't think an artist *can* analyze his work. Georges Braque wrote, or said, that in art what matters cannot be talked about."

The idea of commissioning Rothko to do a chapel had its origin in 1964, when the de Ménils visited the artist in his New York studio. Word had got around about a series of very large canvases he had done for the Four Seasons restaurant in Manhattan. He had completed them but refused to deliver, and the de Ménils wanted to see.

They were overwhelmed by the power and passion of these great somber paintings and understood his distaste for having them displayed in an eating place. To their astonishment they realized that they were speaking in whispers.

They realized the time had come

John and Dominique de Ménil had visited the Chapel of the Dominican sisters of Vence in France, known as the Matisse chapel, and the church at Audincourt, near Belfort, which contains the stained-glass windows considered by many to be the most important work of Léger. Often they had talked of commissioning such a chapel themselves, to contain the works of a major artist, and now they realized the time had come. They broached the idea to Rothko, who was ecstatic.

There persists a mistaken notion that some of the paintings withheld from the Four Seasons restaurant were used in the Rothko Chapel. In point of fact, most of the Four Seasons paintings now hang in the Tate Gallery in London and the rest are at Harvard.

As the concept of the chapel began to take form in Houston, Rothko made matching arrangements in his studio, creating a mockup with scaffolding of one section of the intended eight-sided chamber. He also insisted on approving the materials that would be used

inside the chapel. The walls had to be of raw, unpainted concrete. As Dominique de Ménil has written, in a recent issue of *Art Journal,* "The mere suggestion of white walls threw him into a panic. He had an abhorrence for pure white, which he equated to hospital sterilization."

All the while Rothko was undergoing the stresses of creativity. Mr. de Ménil showed me a letter from the painter, dated January 1, 1966. "The magnitude, on every level of experience and meaning, of the task in which you have involved me," Rothko wrote in his strong hand which flowed in straight lines across the page, "exceeds all my preconceptions. And it is teaching me to extend myself beyond what I thought was possible for me. For this I thank you."

The de Ménils do not believe that Rothko's suicide, at 66, had any direct connection with the Houston commission or its completion, or with the question of what he might possibly do after an act so tough to follow. Even though he did have personal problems, including failing health, they regard his suicide as the unlikeliest thing in the world. He had been looking forward to the completion of the chapel and was making plans to drive down for the dedication ceremony.

Early this year, when the time came to bring the paintings to Houston, elaborate arrangements had to be made. The simple thing would have been to remove the canvases from their stretchers and roll them up like linoleums. But Rothko had stressed that he did not want this.

So the unwieldy frames with their tautly stretched canvases had to be hoisted through the studio skylight and down onto the Manhattan sidewalk. They were loaded into the world's largest moving van, a conveyance with controlled climate which the Mayflower people had chartered in California and brought to New York for the job. The biggest of the pictures, 11 by 15 feet, cleared the roof of the van by half an inch.

En route to Houston the truck passed through three snowstorms. One was a blizzard so sudden and severe that the driver and his helper had to take refuge in the controlled air with the paintings. Otherwise the trip went off without a hitch. On the outskirts of Houston the truck pulled into a drive-in and the driver called the de Ménil office.

"Lady," he said to the secretary, "we got three million bucks worth of art out here. What do you want us to do with it?"

At the rate prices for Rothko paintings have been going up, the figure may not have been far off. There was space in the chapel for 14 of the canvases but the shipment totaled 18: Rothko had painted extra ones

A mathematician and physicist, Mrs. de Ménil now directs Rice University's Institute for the Arts.

John de Ménil, a former Paris banker, is one of Houston's leading industrialists and philanthropists.

to give latitude in the final selection and display. These four were exhibited at the Houston Museum of Fine Arts at the time of the chapel opening and are now in storage there. If the Institute of Religion and Human Development elects to sell them, the proceeds could help to put the drive for the endowment over the top.

The de Ménil family's own fortune mostly flows from the pipelines and drilling rigs of the world's petroleum industry. You could not imagine two people more unlike the cardboard, caricatured notions of the way oil-rich Texans talk, look and behave.

French-born and educated in Paris, the de Ménils moved to Houston in 1941 and became naturalized U.S. citizens in 1962. For all their involvement in the affairs of their adopted city, they remain indelibly international in life-style and outlook.

Dominique de Ménil, who was schooled as a mathematician and physicist, is the daughter of Conrad Schlumberger, one of the two brothers who founded Schlumberger, Ltd., the French parent company of a worldwide consortium of companies dealing in oil-drilling equipment and electronics. Her husband, scion of a French banking family and a former Paris banker, is the retired chairman of Schlumberger, Ltd. He routinely shuttles between Houston, New York and Paris, seeing to the family holdings and in pursuit of his and his wife's shared passion for art.

Dominique de Ménil is one of the country's most respected art historians. As director of the prestigious Institute for the Arts at Rice University, she has won acclaim for the major exhibitions she has assembled there and launched on tours. A current show, consisting of more than a hundred surrealist paintings, drawings and sculptures by Max Ernst, is touring the museums of Europe.

At 63 she is a handsome woman with extraordinary physical grace. With her husband, who is four years older, she shares a reputation for hospitality and gentility. But they also have a stubborn streak of tough-mindedness and can be as hard and unbending as drill bits if that is needed to carry the day in a cause in which they believe.

As one associate at Houston's Museum of Fine Arts puts it, "They have lots of detractors, and some of them consider the de Ménils niggardly. This is based on the fact that they get their way or they don't play. I suppose this is considered to be un-American. But it happens that the de Ménil way is nearly always the right way."

An illustration of the rules by which the de Ménils operate involves the rupture in their patronage of the Roman Catholic University of St. Thomas in Houston. It resulted from a difference of viewpoints over the de Ménils' plans for the Rothko Chapel. Dominique, who was then chairman of the art history department at St. Thomas in one of her labors of love, had assumed automatically that the university would take over the chapel as sponsor. But the holy fathers balked at the de Ménils' ideas about its ecumenical function.

A Gallic long view of history

Meanwhile, under the leadership of Mrs. de Ménil the art history department had achieved an outstanding reputation. Would the de Ménils help, they were asked, to upgrade the rest of the university? They agreed—but as in the case of the Barnett Newman obelisk, imposed a condition: Administrative control of the university would have to be taken over by laymen. In the resulting impasse the de Ménils found a new sponsor for the Rothko Chapel—the Institute of Religion and Human Development—and Dominique hauled her entire art history department—staff, collections, the works—over to Rice University.

John and Dominique take the Gallic long view of history. In the wake of Vatican II it has become their belief that ecumenism—in religion, art, science and the whole of human experience—represents the world's best and perhaps only route.

They are filled with optimism and with hope. They believe that this is the spirit which radiates from the dark paintings in the Rothko Chapel. They believe that the chapel and its treasured contents will still be there 1,000 years hence, as a shrine to humanity's discovery of a Godly way to peace. This, they think, is the core of the mystery.

The steel sculpture in the chapel's reflecting pool is the late Barnett Newman's *Broken Obelisk*.

Bowsprits over South Street in 1878: center of maritime commerce for the Port of New York.

By Elizabeth Barlow

On New York's aged waterfront, a pinch of salt

Along Manhattan's South Street, nostalgic New Yorkers are attempting to restore some of the flavor of the old-time harbor

Below the great Gothic pylons and harpstrings of the Brooklyn Bridge lies Manhattan's South Street. In the age of sail, South Street was a synonym for the Port of New York but nowadays lower Manhattan is ringed with abandoned piers.

By all odds South Street would appear doomed, a victim of the New York City game called Real Estate Dynamics. The trend is clear: The old small-scale industries are dying or moving elsewhere as land values continue to escalate, and towering office buildings are usurping their spaces on the urban chessboard. But a curious confluence of energy, money and love has been focused on South Street in the last five years. A renaissance of the salty past is occurring, sparked by the South Street Seaport Museum, a 15,000-member group which has so far successfully challenged the bulldozers.

The founder and president of the Seaport Museum is an ex-advertising man named Peter Stanford. He is

The F.D.R. Drive will still loom over these South Street buildings after they are restored.

quick to point out that the museum is no museum in the conventional sense. "It is not meant to be some impressive structure in which you collect a lot of artifacts of the past, but a living, functioning environment. Here we don't feel that the past is a separate attic; we believe it is something that is at the *roots* of man's experience."

Specifically what Stanford and the museum's directors have done is to get an 11-block area around South Street declared an *unassisted* urban-renewal area, which means that the money for redevelopment must come from private sources. Jakob Isbrandtsen, a director of American Export Industries and chairman of the museum's board, has guaranteed a several million-dollar loan from a consortium of six banks, and with this capital the museum has purchased the blocks.

Member donations and seed money from a foundation have made it possible to begin refurbishing some buildings and restoring the museum's growing fleet which at present consists of the *Ambrose* lightship, a tugboat called *Mathilda,* an old Brooklyn ferry, the schooners *Pioneer* and *Caviare* and the enormous square-rigger *Wavertree.*

It all started in 1966. U.S. Attorney Whitney North Seymour jr., a state senator in Albany at the time, introduced a bill to designate Schermerhorn Row, as the block between South and Front streets used to be called, a state maritime museum, and it was passed—without an appropriation for funding it.

Peter and Norma Stanford are weekend sailors but they love the city, too. They were shopping around for a disabled old schooner which could be repaired and

Elizabeth Barlow regularly patrols New York's past and its emerging future. Her story on Welfare Island's new city appeared in the February issue.

A pinch of salt

docked nearby, a small but tangible reminder of the days when South Street was overshadowed by a forest of masts instead of the F.D.R. Drive.

A trip to San Francisco's Maritime Museum convinced them to enlarge their ambitions from schooners to square-riggers and from a few historic houses to an historic district. But a seaport in some place like Mystic, Connecticut, is one thing and a seaport on land valued at $100 a square foot is another.

Richard Buford, a city planner in the Lindsay administration, helped engineer the solution to this dilemma by working out the machinery for the transfer of "air rights" over the 11 blocks. The logic behind the transfer of air rights is this: Allow the six blocks bordering on the seaport to build higher than is otherwise permissible under the zoning code, while simultaneously ensuring that the five seaport blocks remain at a low five-story scale. The same amount of office space will be provided as if the whole area had been redeveloped with buildings of uniform height, and the new buildings will still receive sufficient sunlight and surrounding open space since the seaport blocks act in effect as a giant plaza.

Because the museum owns the entire 11-block urban-renewal area, it will profit by the sale or lease of the "transferred" air rights; the city too will receive the same tax revenues it would have had if the entire area had been rebuilt in the conventional fashion.

In 1967, with Isbrandtsen's first gift, $5,000, the museum took over Number 16 Schermerhorn Row as the first of a number of planned exhibit spaces it hopes to sprinkle throughout the South Street area.

Joseph Cantalupo, a museum board member, says, "What we've got here is better than a history book. Kids look around these streets which are like they were when the place was a beehive of commercial and seafaring activity. I'll tell you, it means more to me for the museum to get $5.16 in contributions from the children in Grade 5 in P.S. 2 than $5,000 from Jakob Isbrandtsen. Don't get me wrong. I like everything he's doing to make the museum successful. But it's the kids caring that really counts."

Cantalupo, who was himself one of the museum's earliest enthusiasts, is a son of South Street or, to be more exact, Front Street where he and his two brothers run the rubbish-removal business they inherited from their father Pasquale.

Cantalupo's affection for South Street is not the enthusiasm of the sailing buff ("I went out on a fishing boat twice as a kid and got sick both times"), but the enthusiasm of the city-lover.

As Cantalupo explains it, this section of the city is even today as much of an ethnic bouillabaisse as were the sailing crews of old. "You have Italians, Irish, Filipinos, Eurasians, you name it." You see these people, children in tow, strolling along the museum's Pier 16, congregated around the *Caviare,* enjoying the chantey singers' free performances on Tuesday evenings in the spring and summer.

Lodestar for the bouillabaisse

South Street is also the diurnal magnet for the office crowd that pours out of the flanking skyscrapers at noon, Monday through Friday—the Wall Street businessmen who patronize Sweet's Restaurant and the paper-bag brigade that flocks onto Pier 16 to watch an old seadog named Ed Moran mending the rigging on the *Caviare,* or just to sit on the old barrels provided by the museum with their faces upturned to catch the sunshine. Hardhats, too, from the construction sites nearby take their lunch break on the pier, making appreciative comments about the secretarial talent that is on parade.

Neighborhood residents, businessmen, office workers, hardhats—all are part of the reservoir of volunteer manpower that keeps the museum running. For instance, five construction men stay around South Street *donating* carpentry services to the museum after their regular working day. Printers and insurance salesmen are among those volunteers who act as information guides on Pier 16 during the busy noon hour.

Every weekend high school and college students come to Pier 16 like merchant sailors to sign on for volunteer duty. Supervising the students on Pier 16 is Doug Burris, the Seaport Museum's dockmaster and a Navy officer before he joined the Seaport Staff.

Pointing to the museum's two schooners, the *Pioneer* and the *Caviare,* Burris explains, "The *Pioneer* is a Delaware River shoal-draft schooner built in 1885 to carry iron from the Chester Rolling Mills in Pennsylvania. In 1968 she was taken down to her ribs and

completely reconstructed. For all intents and purposes she's a new vessel. The *Caviare* is a former Gloucester fishing schooner. Her hull is sound and she's fully rigged but her lines are rotten in places and she's not yet seaworthy. Now there's some controversy whether *Caviare* really was her name or not. Some people think she was the *Caviare* and others maintain she was the *Lettie G. Howard,* and when you get them arguing with each other it's like watching Civil War buffs re-enacting battle scenes."

While the *Caviare* (or the *Lettie G. Howard,* as the case may be) is being renovated by volunteers, the museum's status symbol, the huge 2,100-ton *Wavertree,* is receiving professional attention under the direction of consultant William Lacey, a captain in the U.S. Merchant Marine.

According to Peter Stanford, "The *Wavertree* herself has a rather ordinary story to tell; she set no records, had no famous skippers and never flew the American flag until Ambassador John Davis Lodge hoisted it aboard the partly restored hulk in Buenos Aires in November 1969, where the *Wavertree* had been working as a sand barge. Built in 1885, the *Wavertree* had been violently dismasted off Cape Horn in 1910. Thereafter she took up an obscure life as a barge, first in Chile, then, after World War II, in Argentina. In 1968 she was presented to the South Street Seaport Museum, another gift of Jakob Isbrandtsen; a number of other citizens helped make her return possible, and are engaged in raising the million dollars required for her restoration."

Reward for volunteers: day's sail on the one active ship in the Seaport's fleet, a Delaware River schooner, the *Pioneer,* seen near Verrazano bridge.

One of the first installations in the Seaport complex, this bookshop will be followed by restaurants, ship chandlers, a model shop and small museums.

Across the F.D.R. Drive (in foreground), nestled among New York's glossy behemoths, the Seaport's restored blocks will be a living piece of the 1800s.

A pinch of salt

While the heavy, technical work of the *Wavertree* is being performed by paid labor, a lot of small jobs such as scraping and refinishing the floors in the officer's cabins is the work of volunteers.

Some, but by no means all, of the volunteers who come to South Street are sailing buffs, and for them the desired reward for their dockside dedication is to stand at the helm of the *Pioneer* as she sails on the East River into the waters of Long Island Sound.

But the Seaport is more than a place for sailors. As Peter Stanford points out, "Nowadays yachtsmen congregate around Long Island Sound rather than Manhattan. South Street is really for those who believe in this city—both its past and its future. It is wrong to look on the volunteers mechanistically, as a way of getting the museum's work done. The museum *is* the volunteers. It exists not just *because* of them, but *for* them, so they can look at a little piece of New York and say, 'Something of my hands and head, something of *me* is here.' "

South Street used to be dotted with packet offices where you came to book your passage to Liverpool or Le Havre. Sailors' hotels and grog houses were salted throughout the area around Front and Pearl streets. Unscrupulous runners for fleecing immigrant boardinghouses seized the "tween-decks" steerage passengers as, uncertain and gullible, they stepped ashore for the first time in the United States.

Cantalupo can remember when ship chandlers were still doing business on South Street. He also recalls the tobacco warehouses, the leather-tanning establishments, printing houses and coffee-roasting plants, the last of which moved out only last year. He says, "There was a beautiful odor to the whole place. I can't describe it to you, but it was beautiful, that salt air-fish-leather-printer's ink-coffee-tobacco combination."

Now only the venerable 150-year-old fish market remains and in the next two years it is scheduled to move to new quarters in the Bronx. Although only a small group of fishermen deliver at dockside, it is still a wonderful sight to see the busy fishmongers uncrate wooden boxes of fish. Before noon the men and the trucks have cleared out, the metal bins from which the fish are sold sit empty, the fishmongers' stalls are closed down, opalescent fish scales litter the cobblestones of South Street, and an unmistakable smell lingers in the air.

The fish market will be reconstituted—a place where the lunchtime and tourist traffic can rub shoulders with the past in a relaxed fashion. It will contain seafood restaurants and oyster bars, marine-exhibit stalls and bookstores and ship chandlers. A model shop is scheduled to open soon in an 1835 building on Water Street under the management of Martin Rockmaker, a professional model shipbuilder.

Various "house museums" will be distributed throughout the five restored blocks. The Museum of American Folk Art is considering a move to Beekman and Front streets. A museum of whaling and fisheries and a family shipping museum are also being discussed. A fire museum is tentatively planned, an appropriate addition since South Street has been ravaged several times by fire in its long history.

Salvaging more than mementos

One of the most dramatic and tragic fires occurred on the night after Christmas 1853. The largest clipper ship in the world, the 4,555-ton *Great Republic,* was docked at the foot of Dover Street just below where the Cantalupo Carting Corporation stands today. To everyone's horror some of the tobacco warehouses on Front Street caught on fire, and sparks from that blaze ignited the *Great Republic's* topsails. Firemen, half-frozen in the bitter cold, played their hoses against her lower yards; the water could not reach her burning topmasts. Soon the flaming top yards came crashing onto the deck, and the conflagration roared until nothing was left of the ship but a charred hull.

But the *Great Republic* was not finished. The hull was salvaged and she was rebuilt with shortened masts and yards and three decks instead of four, and was still the largest sailing ship afloat. She was used as a transport vessel for troops during the Civil War. In her lifetime she also established a reputation for speed, on one occasion logging 413 miles in a single day.

Like the *Great Republic* there is something phoenixlike about the South Street Seaport, a piece of old New York struggling to prove it is salvageable not just as a memento of the past, a curiosity for nostalgia-seekers, but as a living and necessary component of the modern city.

A common sight on Pier 16: old seadog mends rigging on the Seaport's fishing schooner, *Caviare*.

Book reviews

The Blue Whale
George L. Small
(Columbia University, $9.95)

There is a foreboding note of the Apocalypse in the realization that we are about to exterminate the largest animal ever known to have lived, not because we desire to, but simply because we did not know how to stop ourselves from doing it while there was still time.

This is a haunting paradox of human behavior presented by Dr. Small, professor of geography at the City University of New York. It is a case study of human ingenuity having outstripped human wisdom in an insane economic structure which seems to dictate ultimate suicide.

The author is a scholar—also an angry man. His book is not pleasant reading. It is possible to argue with many of his figures, but it is difficult to dispute his overall conclusion that the blue whale is on the verge of extinction.

The blue whale is a remarkably efficient animal, well designed for survival in its environment and capable of withstanding any threat except advanced technology. Unlike the dinosaur which became too huge (although not so huge as the blue whale) to move as circumstances dictated, the whale can range vast distances, seeking out the most benevolent climate, defending itself against natural enemies.

But the combination of steam and harpoon guns in the last quarter of the 19th century opened the era of slaughter. The age of pelagic whaling in the Antarctic, which started about 1925, opened the era of doom. Huge factory ships could process as many whales a day as swift catcher boats could supply. In the 1931 season—the high point in the rush to extermination—29,400 blue whale kills were recorded. No adequate restrictions were ever imposed. Professor Small believes that the animal today numbers somewhere up to 200—far too few to ensure survival.

Even reasonably sensible regulations to conserve the blue whale could not really be enforced. The International Whaling Commission operates by agreement, and its dictates can be vetoed by any member state. (Small regards the Japanese, Dutch and Russians as real villains in this respect.) The economics of whaling dictated intensified killing as the whale population declined.

Those seeking another *Year of the Whale* may well be disappointed. Small is no stylist and his book lacks the charm of Victor Scheffer's work. But Small is eloquent when he poses a proposition.

"The tragedy of the blue whale is the reflection of an even greater one, that of man himself. What is the nature of a species that knowingly and without good reason exterminates another?"
—George E. Reedy

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African Antelope
Paintings by Peter Skirka
Text by Wendell Swank
(Winchester, $27.50)

African Antelope is distinguished by a simple and direct style and an elegance reminiscent of an old natural-history classic. Careful organization and editing have produced the balanced esthetic and scientific appeal which characterizes this

Wildebeest, a huge antelope of the Serengeti (see article, page 8).

folio-sized reference to the 34 most common and widespread species of African antelope. Peter Skirka's paintings are precision descriptions of male antelope posed in stances or slow gaits. Each painting is accurately scaled.

The short text that accompanies each painting is written by Wendell Swank, a wildlife researcher in East Africa. His essays describe geographical distribution, habitat, food and water requirements, social organization and associated antelope species. He mentions salient criteria for distinguishing easily confused species, such as tail-flicking frequency in Grant's and Thomson's gazelles.
—Chris Wemmer

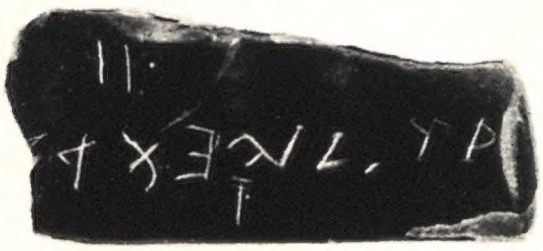
Before Columbus
Cyrus H. Gordon
(Crown, $6.50)

Here is another in the 400-year-old series of attempts to show that American Indian cultures and especially the civilizations of Mesoamerica owe many characteristics to voyagers from the Old World. Gordon believes that there were many contacts over many centuries across both the Atlantic and the Pacific. He hints that he expects to be ignored by "the solid citizens of academia." He will be.

Extreme diffusionists, like Gordon, often underestimate human inventiveness. Explicitly: American Indian civilizations, says Gordon, "could not be, and were not, the works of savages who lifted themselves up by their bootstraps." Extreme diffusionists are often inadequately aware of the huge number of different societies and the tremendous variability in cultures. They are surprised to encounter familiar traits in an area they consider exotic.

And then there is the matter of standards of evidence. Gordon's can be illustrated by an item in the Smithsonian collections to which he devotes a chapter: the "Bat Creek Inscription." This bit of rock was supposedly excavated in 1885 from a burial mound in Tennessee, where it lay under an Indian skull along with two 18th- or 19th-century brass bracelets of non-Indian origin. Scratched into its surface are nine or ten letterlike designs which Gordon identifies as Hebrew of about A.D. 135 and reads as meaning "for Judea" or perhaps "Year 1: Comet of the Jews."

If the reading is correct, one wonders why such a message was written down at all on a small stone in Tennessee, and how this survived to be buried with 18th- or 19th-century trade objects. Gordon does not consider such questions. But the reading itself is far from certain—a member of the Smithsonian's department of anthropology (too modest to take credit) has authorized me to publish here for the first time an equally plausible reading (upside down): He suggests that the stone is inscribed, "Made in Mexico."



Invert page to read start of English word "Mexico" in the Bat Creek Inscription.

Gordon seems unaware of a fundamental principle of archaeology: When an artifact seems markedly out of place, temporally or spatially, it cannot be accepted unless it has been excavated with extreme care and the circumstances of the find have been meticulously documented. If the Holy Grail itself turned up in the Smithsonian storerooms without acceptable explanation, it would be of no historical significance.
—*William C. Sturtevant*

The Omnivorous Ape
Lyall Watson
(Coward McCann & Geoghegan, $5.95)
On the Side of the Apes
Emily Hahn (Crowell, $7.95)

There is a splendid new game for zoologists. Desmond Morris started it, but any zoologist can play. It's called the Ape Game. First pick some aspect of being an animal. Then apply it—call it *x*—to the bones of man's earliest ancestors.

The real trick is to apply the principle in about 256 pages to most tribes of primitive man, most life-styles of civilized man and of course to the other primates as well as some other mammals. If you can do that, you call it *The (x) Ape,* find a publisher and wait for royalties.

So we had Desmond's *The Naked Ape* which was a best seller and then (clever Desmond) we had his variation on the game, *The Human Zoo.* Albert Szent-Györgyi (see SMITHSONIAN, July 1971) gave us *The Crazy Ape,* but that was a bitter book and didn't get to be a best seller.

Now one of Desmond's jolly band has had the thought: "Hey, every animal *eats,* and some eat *everything!* Wow!" and he has delivered to us the newest entry in the Ape Game. It is called *The Omnivorous Ape.* It is about eating habits. It is full of neat anecdotes and funny facts. Enough?

Then turn quickly to Emily Hahn, an angel on the side of the apes. Hers is a *New Yorker* profile, expanded to book length, of the nonhuman primates and the human ones who study them: a detailed tour of the relatively new field of primatology. It includes a great deal of information, some splendid anecdotes (such as one about the famous Pavlov who visited Yale and was enraged when some chimps spat on him) and some of Miss Hahn's own perceptions: "Come to think of it, jaunty is a good word altogether for baboons. There is something attractively crazy about them, and to my mind they are beautiful." In a low-key and often jaunty way, so is her book.
—*James K. Page jr.*

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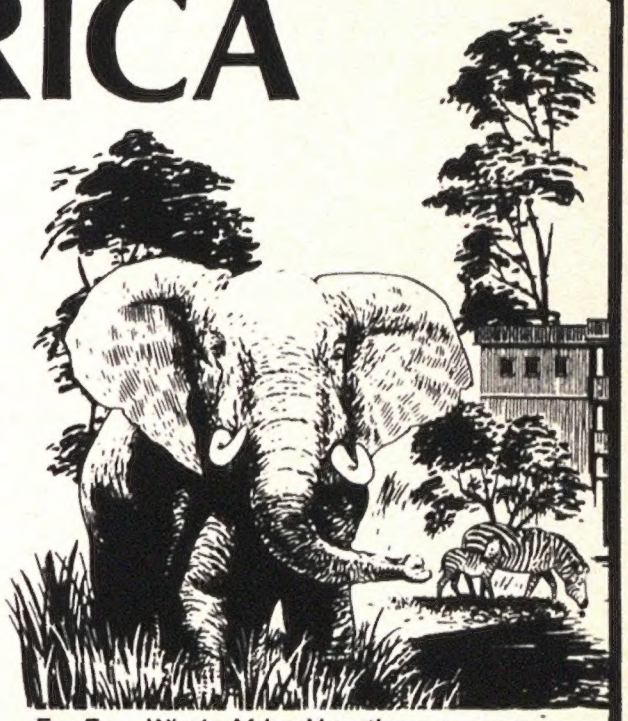

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Smithsonian highlights

The Museum of History and Technology, Museum of Natural History and Arts and Industries will be open from 10 A.M. to 9 P.M. daily through Labor Day. Other Smithsonian museums are open from 10 A.M. to 5:30 P.M. daily.

Museum of Natural History
"Insect Zoo" is an exhibit of live insects including a beehive, termites, many varieties of cockroaches, mosquitoes and dragonfly nymphs. It also includes tarantulas and spiders weaving webs.

"Animal Artists" features about 40 works of art by well-known painters belonging to the Society of Animal Artists.

National Portrait Gallery
"'A Glimmer of Their Own Beauty': Black Sounds of the Twenties" focuses on blues, jazz and poetry with a period jukebox, films and readings reflecting black life in the Twenties.

"Mary McLeod Bethune" exhibit includes portraits and photographs, surveying the life of this founder of the National Council of Negro Women and member of President Franklin Roosevelt's Black Cabinet.

"Portraits by Winold Reiss," used to illustrate *The New Negro* by Alain Locke, depict the central figures who contributed to the Harlem Renaissance.

National Collection of Fine Arts
"Hidden Aspects" is an exhibition of diverse treasures belonging to the National Collection but not usually on view. (See SMITHSONIAN, July 1971.)

"American Master Prints" is a survey of three centuries of graphic art in America from the Smithsonian collections.

"Romare Bearden: The Prevalence of Ritual" presents 56 works including collages by this contemporary black artist.

Arts and Industries Building
Stereoscopic closeup photographs taken on the lunar surface are on display with a camera identical to the one used to take the pictures. The Apollo exhibit includes a flight-weight, operational, back-up Lunar Module and the largest lunar sample remaining from Apollo 11.

Division of Performing Arts
"The Waywardly Wandering Wagonful of Banjo and Jack," created by the Allan Stevens company, is featured at the Smithsonian puppet theater. The show includes 19th-century folk songs and stories. Daily, Wednesday through Sunday, Museum of History and Technology.

Traveling Exhibition Service
Nashville, Tennessee — "Contemporary Painting in New Zealand" (Tennessee Fine Arts Center, August 7-September 5).
Newark, Delaware—"Historic Architecture, Urban Design of Nantucket" (University of Delaware, through August 22).
Berkeley, California—"U.S. World War I Posters" (University Art Museum, through August 22).
New York, New York—"Dead Sea Scrolls" photographic exhibit (American Bible Society, August 7-September 5).
San Antonio, Texas—"Shout and Silence: Visual Arts and the Deaf" (Bexar County Hearing Society, August 7-September 5).
Detroit, Michigan—"Toledo Glass National III" (Detroit Institute of Arts, August 7-October 24).

Anacostia Neighborhood Museum
"Man's Greatest Adventure" is an exhibit illustrating the contributions of the black man to science in America.

Smithsonian Commons
Luncheon facilities for staff, resident scholars and all members of the Smithsonian Associates are located in the original Smithsonian Building. Open weekdays from 11:30 A.M. to 2:00 P.M., the Commons offers a buffet luncheon from $1.25 to $1.75 upon presentation of a membership card.

Museum of History and Technology
Hall of Musical Instruments presents informal concerts using instruments from the Hall, August 4 and 18 at 1:30 P.M.

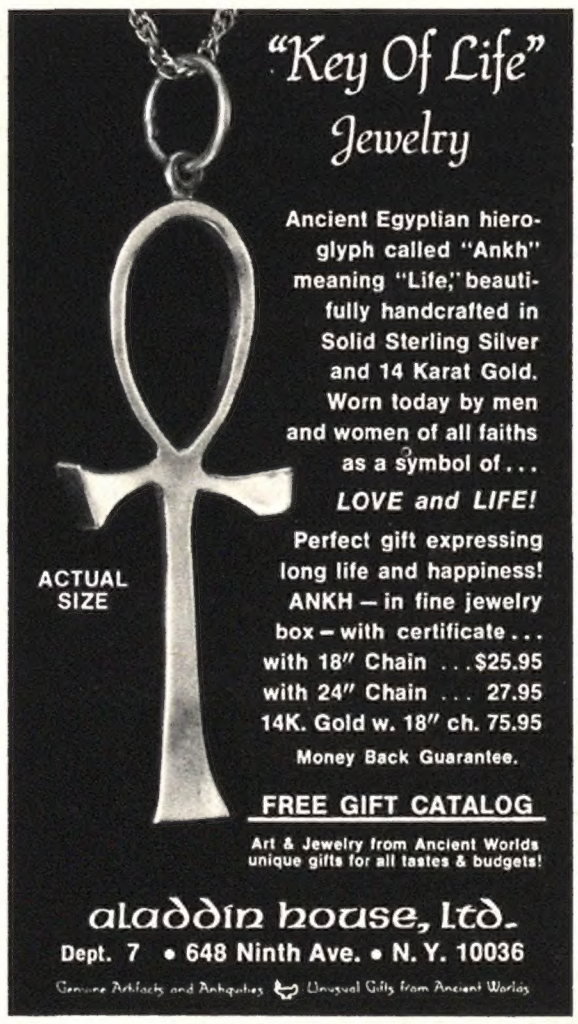
"American Heroes" is a slide show projected 40-feet high on the Constitution Avenue side of the building, including 18 slides of such American heroes as Washington, Jefferson, Lincoln, the Roosevelts, Martin Luther King and Chief Joseph, daily at 9 P.M.

"Microfilm" commemorates the centennial of micro-image technology, exhibiting equipment, film and blowups, and illustrating the evolution of microfilm from creation to future applications.

"The Black Ships" is a Charles Eames film showing artifacts of the journeys of Commodore Perry, including the opening of Japan.

"Slovenes in America: An Instance of Cultural Impact" includes artifacts and photographs reflecting the religion, society and home life of Slovenes and their influence on the American way of life.

"Soup Tureens," collected by the Campbell Soup Company, make up this exhibition which includes many porcelain and silver antiques.



By Patrick Ryan

A good bar dispenses sympathy with a drink

All who feel that the skids are under civilization will find food for melancholy in a proclamation that Chicago's Jolly Chef cocktail lounges are installing electronic bar systems. They betray their jovial name.

The Electra-Bar is described by its perpetrators as comprising a register, a computer logic unit, two six-bottle racks, a dispensing head and a compressor *(God rest you merry, gentlemen).* The bar register contains 36 keys each representing a different potion. When the thirsty customer places his order, the bartender simply depresses the appropriate key for the desired perspective juice. In just 1¾ seconds the ingredients are pumped to the dispensing head whereat a drink, according to formula, is automatically poured at the touch of a glass *(Come, landlord, fill the flowing bowl until it doth run over).* The machine can be operated by one bartender with Stakhanovite output and is proudly claimed to bring to its customers the benisons of "quick service and consistent drink quality while maintaining the tightest possible inventory and cash control." So what.

Weary breadwinners totter into the smoke-cured haven of the nearest bar at the end of another imperfect day for more than just accurately accounted alcohol. They also come in search of a sympathetic ear. Frayed male souls at eventide limp in to dilute their worries, magnify their imaginary victories and rationalize their concrete defeats. Before drowning their troubles, rat race also-rans need a barmaid or bartender to tell them to. And who wants to relate his self-inflicted misfortunes to a time-studied, electronic bar operator who dispenses standard tipples (*e.g.* martinis with a depressingly high vermouth content) in split-second prescriptions by pressing the proper buttons.

Countless are the husbands (including this correspondent) who have kept off the bankrupting psychiatrist's couch just by having someone on the other side of a malt-patinaed bar willing to listen to his version of how life keeps perversely backing up on him. Without interruption, without upbraiding, and offering naught in reply but booze and sympathy.

Recent scientific developments should allow the begetters of electrified dispensers to include these verbal therapeutic services in later models. Some hospitals are already using computer systems to interrogate new patients about their symptoms and thus save the valuable time of paramedical personnel. Some patients actually prefer to answer questions put by a friendly sounding but inanimate machine rather than by a daunting, human interrogator.

So imagine the fully automated bar of the future, no doubt equipped with built-in links to such talk-back computers, sympathetically taped to provide vocal balm for tether-ended topers. Comforting phrases and "dear-dear" murmurs would issue from the lips of audio-animatronic barmaid effigies, maternally bosomed, garbed in traditional black bombazine and programmed to react with pianissimo compassion. The joint of course would be completely automated, with the customer punching out on the 36-button console the number of the potion necessary to remind him that it will all be the same a hundred years from now. The filled glass would not be released into his trembling hand until he inserted his credit card. The law would require that all consoles have breathalizers into which each hopeful client would have to breathe before the cover came off the keys.

If the alcohol content of his exhalation is below puritan-permitted level, the robot, in 1¾ seconds flat, will whip up his glass of neck-muscle relaxant. But if he's already had more than two wet martinis or three small beers, the computer will sound sirens, put through an alarm to the cops and scythe out a pair of metal, mantis-arms to hold him captive till they come to get him.

The doors of the bar will be opened and closed by clocks set to statutory licensing hours. And the floor will be mechanized so that when the closing-time whistle blows, it will become mobile instantly and swiftly sweep all late-night occupants *(One for my baby and one more for the road)* onto cold hard cobbles outside.

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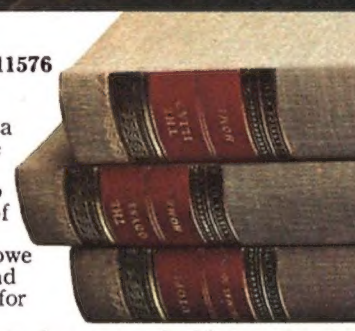

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